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# THE CLIMATE OF DISCOVERY *

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Harvey's cardinal achievement was the demonstration that blood circulates—not the assertion or the opinion, but the demonstration that such a hypothesis alone fitted the available observations. This achievement of clinical science was all the more remarkable because it was made when the renaissance of the arts and sciences, which had been gathering force for nearly two hundred years, had encroached but little on the practice of medicine, which still consisted, in general, of the vigorous peddling of the absurd superstitions and the revolting nostra of the medieval medicine man.

In remembering Harvey we are under an obligation actively to promote his tradition and to do all we can to create a climate in which discovery is favoured. Let us not be beguiled by such catch-phrases as "genius will out," meaning that no special provision is necessary and that the real scientist will triumph against all odds. Few would deny that the store of human knowledge would be immensely wider today if an unknown number of men had not been frustrated at a critical point in their careers. The fact that some have overcome formidable obstacles of grinding poverty, ill health, stifling tradition, and professional jealousy does not mean that such obstacles can always be conquered. For every scientific fruit that has ripened an unknown number must have been blighted.

I propose therefore to consider briefly whether the conditions of practice and our system of medical education, both undergraduate and postgraduate, provide a climate which is favourable or unfavourable to the development of medicine as a science eager to discover, quick to apply, and intolerant of intellectual dishonesty.

* * *

Medicine in all its activities must be a scientific discipline—that is, a compound of observation, deduction, and the proof of validity of deduction. Proof may be obtained either by direct experiment or (more often in clinical sciences) by the planned examination of a hypothesis in the light of phenomena of health and disease as we see them in the course of our care of the sick. Scientific principle requires us to be ever watchful for the unexpected and the anomalous; for these may imply imperfections in our concepts and are often a stimulus to discovery.

It is surprising how many apparently educated people, including many doctors, regard science as an affair of laboratories, apparatus, and formulæ rather than as an attitude of mind which relates hypothesis and plan to controlled observation. It is because of this misconception that some mistakenly hold that the qualities of solicitude and compassion are incompatible with the scientific method. But in fact, it is as much a crime against science as it is against humanity to neglect those qualities of kindliness which are essential to the care of the sick and the supervision of the health of the individual.

The reasons for these criticisms of science in medicine are not far to seek. They are made by those who recoil from the obligations and discipline of science. It is easier to make a facile diagnosis on inadequate evidence than it is to defer final judgment till the evidence is as complete as it can be. It is much more nourishing to the amour-propre to believe that we have cured a patient than to recognise that his natural recovery has coincided with our treatment.

There is still too much of the appeal to authority as a source of inspiration—much in the same way as questions were put to the oracles in the cave at Delphos. The laity, and to some extent the profession, still think of the consultant as someone who gives opinions rather than as one who reviews evidence, checks its validity, perhaps finds new clues, and then outlines, with appropriate action, the possible solutions in their order of probability.

* * *

A major intellectually demoralising influence to which we are exposed is that in the important business of making sick people well there operates the *vis medicatrix naturæ*. Everyone survives all illnesses except his last, often uninfluenced by medical care, not infrequently hindered by medical care, sometimes decisively helped by it. That is the cold unpalatable truth. Fortunately, lay people have little appreciation of this; and I cannot say that we make any great effort to enlighten them. This element of deception may be in the patient's best interests and is not inherently unscientific or immoral, but scientific apostasy sets in when we ourselves fail to recognise when we have only played a passive rôle. It is often hard for us to realise that the peptic ulcer has healed spontaneously without aid from our dietetic régime of cod and sago. We readily ignore the fact that the good season the hay-fever patient has enjoyed after our course of pollen inoculations is due to the weather. We readily believe that our series of recoveries from myocardial infarction is due, partly at least, to our régime of strict bed rest.

To suffering humanity this unscientific credulity on our part brings a heavy burden, because so many of the nostra we give and the restrictions we impose mean for the patient serious curtailment of liberty, discomfort, and even danger. How many promising careers have been cut short by the unwarranted advice to change employment? Think of the untold millions of private and national wealth squandered on unnecessary drugs, indiscriminate physiotherapy, and above all needless rest. Nobody will ever know how many attacks of homologous-serum jaundice have been induced by irrational vaccine therapy or the long courses of gold therapy that used to be popular.

Sins of this sort (it is worth noting) are usually those of commission. When in therapeutic doubt—and in our present state of knowledge that must be often—we readily yield to the fallacious maxim "something must be done." Why do we yield so readily? One reason is that in all of us there lurks a power complex, a desire to dominate our fellow men, to order their uprisings and their downsittings. Presented with the issue to do or not to do, we are hopelessly biased towards action. The defence, so often professed, that the patient demands action, has something to it; but at the same time we make little attempt to educate the public in this respect.

Another reason is inherent in the economics of our profession. It would be hypocritical to maintain that we are totally indifferent to our rewards; and where every incident of illness, every act of therapy is of direct gain to the doctor, it would require a breed of saintly altruists to prevent this vested interest in illness exerting some influence on judgment. We may, indeed, feel some satisfaction that the moral standards of our profession keep the effect of this vested interest as weak as it is. However, the right way to treat this cause of scientific and moral embarrassment is not to ignore it, but to welcome the extension of a system which removes this direct association. There is much to be said for the old Chinese system of paying the doctor to keep the patient well. In this respect medicine is at the cross-roads.

* From the Harveian oration given to the Harveian Society of Edinburgh on June 3, 1955.

In our country education of the public in medical matters is beginning to follow the line of encouraging patients not to seek medical aid for each and every complaint but to learn the sort of troubles which need medical aid and the sort which are self-righting. In the United States health education tends to make the public so disease-conscious that some have a complete "check-up" every year. There are obvious dangers in both systems, but I feel that ours ought to develop a public more health-conscious and more self-reliant and a profession capable of developing to the full the increasing resources of scientific medicine.

* * *

In education today we hear much about principles —always "fundamental" or "basic" principles, the teaching or inculcation of which is the proud prerogative of this school or that department. A good deal of snobbery is attached to these terms. The more basic or fundamental the principle is deemed to be, the nearer are all those concerned to some mystic state of academic grace. Much of this is little more than an example of the limitations of language. Logically it presupposes that there exists somewhere a finite body of fundamental truth. The detailed curricula of medical schools, the itemised requirements of examining bodies, even the recommendations of the General Medical Council, tend to be regarded as a supreme polypharmaceutical prescription, the accurate dispensing of which will result in the "compleat physician."

At the risk of being hoist with my own petard I venture to emphasise that the fundamental objective of medical education, indeed of all education, is to develop the human mind as an instrument of observation, deductive and inductive reasoning, and rational expression in word and action.

The first step in medical education is the selection of candidates. These must be willing in the sense that theirs is a free choice: they must not be coerced by the State or by their parents, and, if their ability is adequate, funds must be available for their training. And obviously, if there is to be selection there must be more applicants than student places.

The inducements to choose this career are many. Though medicine as a profession is not so prosperous as in the days before the late war, it has more than maintained its relative position among the other professions. In respect of pecuniary reward, its members are the envy of other professional groups in the service of the community, such as Civil Servants or teachers. But its appeal as a career does not rest to any great extent on its material attractions. Above all it promises an interesting life, full of variety, repeated challenges to intellectual endeavour, and high esteem for work well done.

Now, I maintain that medicine demands, in general, people of above-average intelligence, and a certain number of the very best. But the proportion of the community in any intelligence bracket is relatively fixed; and there are other more pressing calls on the intellectually gifted. The intensely competitive circumstances of modern industrial life show that the survival of a nation such as ours depends on the greatest possible development of the sources of true wealth—that is the harnessing and efficient use of power; the garnering, processing, and synthesising of materials; their fabrication into articles in wide demand; and above all the organisation of society on a world-wide scale into a contented, well-fed, healthy, and happy community. The Government's appreciation of these needs is shown by their preoccupation with the development of technological education at the highest level. The survival of *Homo sapiens* as a social animal depends on an adequate supply of applied scientists, among whom medical men and women have an important but not dominant place. This position of secondary importance must be kept in mind when considering recruitment to medicine, the allotment of material resources to medical education, to the health service, and in the deployment of the profession.

Meanwhile we must evidently take as much care as possible in student selection; and, in order to tell us how to select correctly, we need more organised quantitative studies, by such methods as the cohort technique. This procedure consists in the sustained observation of a group of people from the point at which they enter medicine until they are established in their chosen branch of the profession. Only by such means shall we discover what truth there is in the persistent rumour that quite often the poor student, who is the despair of his teachers and the sorrow of his examiners, turns out to be a wonderful family doctor. I suspect, but have no proof, that this is merely an expression of our inherent compassion for the weaker member and is just another version of the Cinderella legend. The more information we have about the candidates, the more carefully we interview them, the more use we make of those faculty members who have an aptitude for selection, the fewer mistakes will be made. Very close attention should then be paid to performance during the preclinical years so that misfits can be discouraged from proceeding further. Most of these will have awaiting them a successful career in some other walk of life.

* * *

Since the war medical schools have accepted only students reading for a degree; and, though a few fail to gain a degree and have to be content with the diploma of one of the licensing bodies, they still have had the same training as the graduates. In principle, this is entirely satisfactory; but unfortunately much of the current practice in medical education falls short of the true ideals of a university education. It is all too possible for a student to attend lectures, fulfil laboratory and clinical schedules, pass examinations, and in due course wear the bachelor's hood, without acquiring the faintest glimmering of what constitutes a university. Even worse he can later acquire sufficient purely vocational competence to gain him a place as a teacher in a university medical school, from which position he may promote the continuation of this travesty of the university ideal. I am sure many of us at times must be acutely and anxiously aware that the claims of medicine to take a worthy place alongside the humanities and the sciences as a university discipline are at times more traditional than contemporary. Much lip service to the university ideal is combined with ignorance of—and occasionally, cynical disregard of—what it stands for.

The medieval Latin word *universitas* means a society or community—that is, a group of people banded together. One of the uses of the term was in connection with a *studium generale*, in which sense it was used in the context *universitas magistrorum et discipulorum*—that is, a community of scholars, senior and junior, *socii et discipuli*, joined together for the promotion of scholarship. The "universal" or "general" concept has reference to the fact that such corporations may be joined by anyone capable of profiting by them, without distinction of class, age, or rank. The *studium generale* has come to have attached to it another sense in its implication of breadth of scholarship. This recognises the many factors common to all branches of learning and the stimulation of intellectual communion between scholars of varied disciplines. Prof. E. Allison Peers, who under the pseudonym of "Bruce Truscott" wrote *Red Brick University*, therein defined a university as "a corporation or society which devotes itself to a search after knowledge for the sake of its intrinsic value." It is this seeking after knowledge which is

neglected in many university medical schools. It should be a basic article of faith of all university teachers that critical scholarship and search for new knowledge, or research as it is now called, is the primary aim of a university—"not merely actual discovery, not merely even the attempt to discover, but the creation and cultivation of the spirit of discovery."

Without research a university cannot exist in anything but name; it would be simply a cramming institution or a craft school. There could perfectly well be a university, like All Souls College, Oxford, or the Institute for Advanced Studies at Princeton, which had no undergraduates but devoted itself entirely and exclusively to the pursuit of knowledge recruiting its members from scholars who had been trained elsewhere. Nowadays in medicine the highest embodiment of the basic principle of the university ideal is often to be found not in the medical schools, but in such communities as the Medical Research Council's institutes at Hampstead and Mill Hill and the Institutes of Public Health at Bethesda, Maryland.

* * *

How then are these twin ideals of vigorous research and good teaching to be welded into an effective instrument of university education in medicine? One thing is crystal-clear—it cannot be done by planning alone. One of the diseases of our society is this erroneous belief that the brave new world will come to pass by miracles of structural design and intricate organisation alone. Plans there must be, but personalities must take precedence of plans. The basic essential is to ensure that medical students, both undergraduates and postgraduates, are associated with (not just taught by) those whose lives and work are examples of excellence in scholarship and professional skill. These teachers must be ever dissatisfied with their efforts, critical of themselves and others, forever scheming and striving to test the truth of what appears to be known, and planning to enlarge knowledge. Among such there is no room for the complacent, the arrogant, the staunch upholder of tradition, and the stout defender of the status quo. The quality of our teachers is all-important and a heavy responsibility rests on those who have to select the academic staffs and consultants responsible for medical education.

So many qualities are necessary in the university clinician that it is rarely possible to find them all highly developed in one person, but two seem to me essential: first, devotion to the care of people in sickness and health; and, secondly, intellectual humility. Someone endowed with these two qualities will always be seeking new knowledge which will make him a better doctor and will realise the constant obligation to prosecute and instigate investigation. The limitations of human ability are such that only a few will achieve outstanding discoveries; but all can promote such discoveries by facilitating fruitful associations with the pure scientist, and fostering, by kindly criticism and patient discussion, the spirit of inquiry in his students and associates. Such a person should reserve his impatience and intolerance for those who are complacent, intellectually dishonest, jealous, and, above all, unfeeling and harsh to patients. The enumeration of such qualities arouses in me profound disquiet, as I realise how often and in how many ways my practice falls far short of my precepts.

Promotion to academic and consultant posts in the clinical subjects has been handicapped by the fact that, until the introduction of whole-time clinical units and the health service, these posts did not offer a livelihood, and could seldom be accepted by anyone who had not already sunk economic roots in the locality. As a result, standards have varied greatly from place to place and from time to time in the same place. Those responsible could often have chosen better if the field of candidates had been nation-wide instead of parish-wide. The recent severance of geographical and economic bonds, and the consequent interchange of clinicians, has greatly revived teaching and research in clinical subjects and has already largely corrected the inbreeding, with inevitable decadence, which was clearly evident in many schools.

* * *

Large classes, much formal lecturing, didactic teaching, elaborate compulsory time-tables, and slender staff-student contacts make the basic university concept of a community of scholars difficult or impossible to attain.

Clinical teaching and the community life of the teaching hospital should be an ideal environment for scholarly communion. That it has often failed is due to a variety of reasons. Prominent among these has been the fact that staff members have not spent enough time in leisurely discussion with their colleagues—from their seniors down to the junior students—and in forming discussion groups with laboratory clinicians and non-clinical biologists from preclinical or even premedical departments. A sure sign of intellectual vigour in a teaching hospital is regular meetings variously organised as clinicopathological conferences or as "grand rounds." By these meetings—the exact label does not matter—the visitor can soon gauge the intellectual climate of the community. If he finds the attendance good; the discussion natural and easy, with the most junior free to speak and assured of a patient hearing; the dubious or unsupported assertion, whoever makes it, promptly, firmly, and courteously criticised; and the quality of exposition and deduction scientifically sound—then he can be sure that the climate is healthy. Only a few years ago this favourable atmosphere was a rare phenomenon in a British medical school; but now it is quite often to be found.

Formerly, what I call "the chief complex" predominated. Teaching hospitals tended to be divided into separate firms and departments, the headship of which was achieved automatically by the passage of years. (Surely it is a biological absurdity to assume that ability, any more than somatic growth, continues through life?) The system demanded that the chief should receive respect amounting almost to servility from his juniors. His word was law and it was unheard of for a junior to engage him in debate. This order of things harmed all but the best of the senior clinicians. They were deprived of the modulating, stimulating, and corrective influence of keen young minds. They came to rely too much on their own judgment and ability. For many the attainment of senior-staff status, with its attendant retinue of yes-men, initiated premature intellectual senility. At its worst this system sometimes resulted in a nonentity filling senior office for many years. Those of us who wish to preserve our faculties in some sort of useful working order surround ourselves with no-men, to ensure that our standards shall not sag with our waist-line.

* * *

If medicine is to play a worthy part in the *studium generale* of our universities it must maintain the same standards of scholarship, the same rigorous quality of research, as other faculties. That clinical practice is usually exhausting and distracting may explain, but cannot excuse, relaxation of scientific standards. Nature has no bargain basements or bonus hand-outs in her storehouse of knowledge. The cost of knowledge is the same to a clinician as to a theoretical scientist. Away with all this sentimental obscurantism that masquerades under the euphemism of the "art of medicine," and in so doing preserve and enrich the heritage of William Harvey.

# CONTROL OF WOUND INFECTION IN A THORACIC SURGERY UNIT *

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THE infection of a surgical wound with pyogenic organisms is common and often has serious results. Yet Goodall (1952) found that the generally accepted methods of controlling cross-infection are often ignored in hospital wards. Our own experience confirms this and suggests that the same criticism may be made of the procedures in operation theatres. It is often said that to maintain the highest standards of aseptic practice calls for an extra effort and a disturbance of normal routine which is out of proportion to the advantages gained; but in this paper we shall show how an outbreak of serious wound infection was controlled by more stringent application of the old-established principles of asepsis, with results that justified the measures taken.

The hospital concerned is a modern sanatorium in rural surroundings; it was completed in 1942. There is a three-storeyed building of concrete and brick housing 260 adult male and female beds and a separate single-storeyed block containing 60 children's beds. Most of the rooms hold 4 beds, but on the surgical floor there are also single-bed cubicles. It represents the modern trend in hospital design.

From 1942 selected patients with pulmonary tuberculosis were admitted to the ground floor for medical treatment. Bronchoscopy and (more recently) bronchography were completed there before a decision on the surgical treatment was made. The patient was then moved to the surgical ward on the first floor. After recovery from the operation he convalesced on the top floor before discharge. The average stay in hospital was nine months, and surgical collapse formed the mainstay of treatment. From 1943 to 1949 the operations were usually thoracoplasties, but from 1949 the proportion of lung resections steadily increased.

When major surgery was first performed in the hospital the operative mortality was low, septic complications were rare, and the sputum conversion-rate was good. The morale of the patients, which plays an important part in the treatment of tuberculosis, was excellent. It was therefore particularly upsetting to staff and patients alike when a serious rise in the incidence of pyogenic wound infection occurred in 1952.

The postoperative wound infections were of three types: (1) parietal infections involving the cut edges of the skin and deeper tissues; (2) intrathoracic infections such as empyema after lung resection and extrapleural space infections after thoracoplasty; and (3) infections arising as a result of bronchopleural fistulæ.

* This work forms part of an investigation by the Public Health Laboratory Service for the Newcastle Regional Hospital Board and is partly financed by a grant from the board.

The features which we have accepted as evidence of infection include:

(*a*) Persisting or climbing temperature associated with increasing malaise and sweating. The temperature eventually swings to the "septic" type.
(*b*) Increasing pain in the wound area associated with œdema along the line of incision.
(*c*) Increase of the effusion in the space, evident on radiography.
(*d*) Space fluid leaking from the wound.
(*e*) The development of bronchial fistulæ in resection cases, with the coughing-up of space fluid.
(*f*) The isolation of the infecting organism from the discharging wound or aspirated space fluid.

During the early part of the period under review the interval between operation and the appearance of clinical signs of infection was often as long as three weeks. This interval became progressively shorter and by 1952 it was rarely more than two or three days.

The aftercare of the infected patient has undergone many changes, and optimism resulting from the successful use of antibiotics in one case has often led to disappointment when it has failed in others. Generally, surgical drainage has proved the most effective, but infected chest spaces take a long time to obliterate by granulation tissue. The patient may have looked forward to a smooth convalescence after operation; instead, he is often doomed to months or years of continual wound dressing punctuated by "redrainages," "unroofings," and sinograms. Two cases of fatal secondary hæmorrhage from large thoracic vessels reminded us, in a most dramatic manner, of the serious consequences which may follow these infections.

It was against this background of virulent infections, arising in a modern hospital despite the use of the generally practised aseptic techniques and the modern armamentarium of antibiotics, that this investigation was carried out.

## Incidence of Infection

The histories of all patients undergoing major chest surgery have been examined and from them the incidence of wound infection for each year has been derived. Operations that were performed for the treatment of already existing pyogenic infection have not been included in this series. Table I shows the number and type of operations for each year from 1943 to 1952 with the number of wound infections. There was a considerable increase in these infections from 1950 onwards until the alarming figure of 10·9% was recorded at the beginning of 1952.

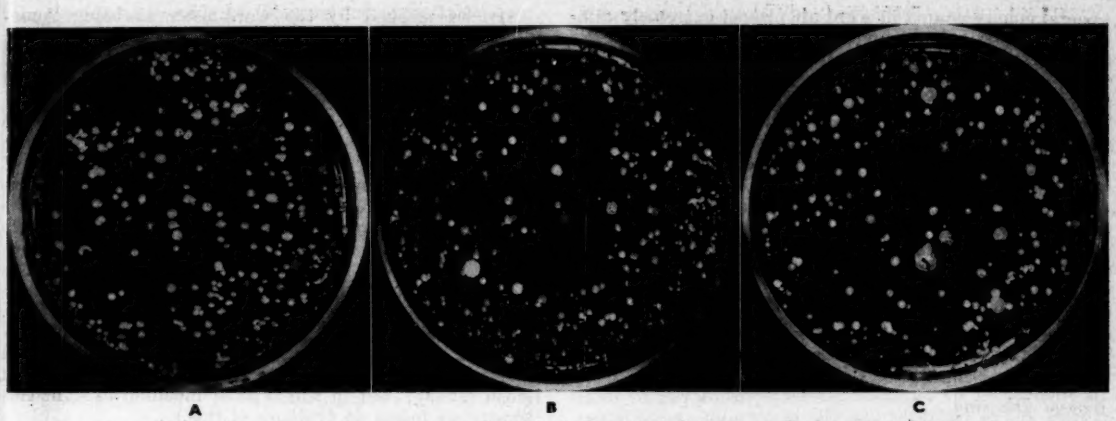
TABLE I—INFECTION-RATES BEFORE REORGANISATION

| Year | No. of major operations | | | | No. of infections |
|---|---|---|---|---|---|
| | Thoracoplasty | Lung resection | Other | Total | |
| 1943 | 26 | .. | .. | 26 | .. |
| 1944 | 65 | .. | 8 | 73 | 2 |
| 1945 | 42 | .. | 9 | 51 | .. |
| 1946 | 54 | 1 | 3 | 58 | 1 |
| 1947 | 56 | .. | 5 | 61 | .. |
| 1948 | 76 | .. | 2 | 78 | .. |
| 1949 | 194 | 25 | 7 | 226 | 2 |
| 1950 | 181 | 62 | 24 | 267 | 10 (3·7%) |
| 1951 | 294 | 61 | 23 | 378 | 8 (2·1%) |
| Jan.–May, 1952 | 95 | 30 | 13 | 138 | 15 (10·9%) |

At first, infection was more frequent after lung resection than after thoracoplasty, but in 1952 there was little difference between the infection-rates for these two types of operation.

## The Investigations

Careful inquiry was made into the hospital procedures that might have a bearing on cross-infection and at the same time bacteriological examinations were carried out on material from patients and staff, as well as on air, dust, and bedding in various parts of the hospital.



A B C

Fig. I—Sweep-plates from blankets: A, from patient's bed; B, in ward store-room; C, after return from laundry.

## THE INFECTED PATIENTS

During the early part of the period under review material from almost every infected wound yielded *Staphylococcus aureus*. During March, April, and May of 1952 material from 10 patients, each with a serious post-operative infection, was examined in more detail. In each instance *Staph. aureus* was isolated.

The organisms were tested for sensitivity to penicillin, chlortetracycline (aureomycin), and chloramphenicol and were bacteriophage-typed by the method of Williams and Rippon (1952) (table II). Most of them were resistant to penicillin, and, though not giving identical bacteriophage sensitivity patterns, they all fall into group III of Williams et al. (1953).

TABLE II—BACTERIOPHAGE AND ANTIBIOTIC SENSITIVITIES OF *Staph. aureus* ISOLATED FROM INFECTED PATIENTS

| Phage pattern | No. of strains | Sensitivity to | | |
|---|---|---|---|---|
| | | Penicillin | Chlortetra-cycline | Chloram-phenicol |
| 75 .. .. .. | 1 | R | S | S |
| 75/76/77* .. .. | 5 | R | S | S |
| 7/47/53/54/75/76/77* | 3 | R | S | S |
| 42E/7/47/70 .. .. | 1 | S | S | S |

S = sensitive. R resistant.
* The Staphylococcus Reference Laboratory no longer includes phage 76 in the routine typing set.

## THE WARDS

### *Floor Dust*

The wooden floors were not oiled, and were swept each morning either dry or after being wetted with tea-leaves or damp newspaper. Dusting was done dry in the usual manner.

From various parts of each of the surgical wards samples of dust were examined with the results shown in table III.

The dust was collected directly on to the surface of a culture medium. $3^1/_2$-inch Petri dishes containing phenolphthalein-phosphate agar (Barber and Kuper 1951) were held in a "dust puffer." This instrument is so designed that a jet of air causes floor dust to be blown against and to adhere to the surface of the slightly moist culture medium. After incubation of the plates, phosphatase-positive colonies were subcultured and tested for coagulase production by the slide technique (Cadness-Graves et al. 1943). It is not possible to express the result of each test in a quantitative manner, but when *Staph. aureus* was isolated numerous colonies were often present.

TABLE III—RESULTS OF DUST SAMPLING FOR *Staph. aureus* BEFORE REORGANISATION

| Situation | No. of rooms examined | No. of rooms positive for Staph. |
|---|---|---|
| Occupied surgical bedrooms .. .. | 6 | 4 |
| Unoccupied surgical bedroom .. | 1 | 0 |
| Blanket store-rooms .. .. .. | 2 | 2 |
| Surgical ward corridors .. .. | 2 | 0 |
| X-ray department .. .. .. | 3 | 2 |

One colony from each positive plate was examined for antibiotic and bacteriophage sensitivity. 7 strains were penicillin-resistant and of the phage pattern 75/76/77. The remaining strain belonged to an unrelated phage-type and was sensitive to penicillin.

### *Bedding*

Sheets were changed and laundered each week. Blankets were sent to the laundry only when they were visibly soiled with excreta, blood, or other discharges from the patient, and also when the patient died. But in the normal course of events a blanket remained on the bed throughout the whole of the patient's stay in hospital. When he was discharged his blankets were used to make up a bed for another patient or were put into the ward store-room for future use.

Sheets and blankets removed from the beds were taken in canvas bags to the ward sluice-room where they were sorted and counted by nurses before being sent to the laundry or otherwise disposed of.

Examining sheets by the "sweep-plate" technique (Blowers and Wallace 1955), we found that even after a period of use, they liberated only a small number of particles yielding *Staph. aureus*. Clean sheets in the ward linen rooms were very nearly sterile and never yielded pathogenic organisms. Examined by the same method, blankets on the patients' beds were found to be heavily contaminated with organisms. These were mostly non-pathogens, but *Staph. aureus* was easily isolated from almost every blanket examined, and sometimes the colonies of this organism were too numerous to be counted. Reserve blankets in the ward store-rooms were in most instances bacteriologically indistinguishable from those in use. Blankets sampled immediately after their return from the laundry were never sterile and often yielded as many *Staph. aureus* as the dirty blankets. Fig. 1 illustrates this.

Examination of *Staph. aureus* isolated from these sources revealed a great predominance of penicillin-resistant strains having the phage sensitivity pattern 75/76/77. By this time, organisms with these properties were regarded as being "hospital types."

### *Air*

With a slit sampler (Bourdillon et al. 1948) and phenolphthalein-phosphate agar, air in the various parts of the hospital was examined for its general bacterial content and for *Staph. aureus*. The interpretation of

general colony counts in ward air proved extremely difficult. Samples taken under apparently similar conditions gave such variable results that attempts to interpret them were eventually abandoned. It was clear, however, that *Staph. aureus* was very easy to isolate from the air in the wards and corridors of the hospital. Here again, there were great variations between individual samples, but over the whole series 161 colonies of *Staph. aureus* were isolated from 470 c. ft. of air. This is an average of 1 particle infected with *Staph. aureus* in 2·9 c. ft. of hospital air.

This was our first experience of the quantitative examination of air for *Staph. aureus* and we could find no reference to previous work of this type. We did not know, therefore, whether this finding represented a dangerous degree of contamination. We decided to assume that it did, and to do all in our power to reduce the *Staph. aureus* content of the hospital air.

*Wound Dressing*

Dressings were normally done in the ward. The techniques used were generally satisfactory but there was considerable variation in method and efficiency. None of the nurses had seen the Medical Research Council memoranda (1941, 1951) on the control of cross-infection in hospitals, and some of the surgeons were unaware of the existence of these publications.

*Sterilising Methods*

The methods were selected by the sister in charge of each ward and varied from relative inefficiency such as the use of glycer. thymol co. *B.P.C.* for clinical thermometers, and surgical spirit for syringes, to the enthusiastic use of neat 'Lysol' for cleaning baths and storing instruments.

*Preparation of Patients for Operation*

On the day before operation the skin of the operation area was shaved and then treated with a disinfectant (several different disinfectants were tried between 1942 and 1952). After this preparation the skin was covered with a sterile towel. This treatment was done in the ward with the patient in his own bed. The process was repeated on the morning of operation. The patient was than transferred from his bed to a trolley, covered with blankets, and taken to the operation theatre.

During the patient's absence his bed was remade with clean sheets but the same blankets, and it was taken to the theatre at the end of the operation.

*Use of Antibiotics*

All major operations were performed under an "umbrella" of penicillin. This was begun on the day before operation and, when the patient made an uneventful recovery, was continued until about the tenth day, or until the risk of wound infection was thought to have passed. After 1948 most patients were also receiving streptomycin for the treatment of tuberculosis.

*Isolation of Infected Patients*

Patients with infected wounds were usually, but not always, put into single rooms. The rooms, however, were part of the general ward unit and communicated with the main ward corridor. These patients were attended by the same nursing and domestic staff as the uninfected patients.

## THE LAUNDRY

Cotton articles were washed in the conventional rotary machines with an anionic detergent. During this process the temperature was maintained at 100°C for ten minutes or more. After drying, the articles were steam-pressed and again reached a temperature of 90 to 100° C. "Sweep-sampling" showed them to be sterile at the end of the process.

Woollen articles, including blankets, were washed with the same detergent but at a temperature of only 37–40°C and were not steam-pressed.

Articles marked by the ward-sister as being "contaminated" were soaked in a cresolic disinfectant solution of uncertain concentration before going through the washing process. These items represented only a small part of the work undertaken by the laundry.

Blankets were examined at various stages in the laundering process, and it was abundantly clear that the methods used were not able to rid the dirty blankets of *Staph. aureus*. Other woollen articles gave results similar to those from the blankets, although the initial and hence the residual contamination was not so heavy. These results were not surprising, since the orthodox low-temperature wash for woollens at 37°C could not be expected to destroy micro-organisms.

Air-sampling in the laundry readily yielded *Staph. aureus*. It was therefore thought possible that recontamination of washed articles might occur in the centrifugal hydroextractors in the manner described by Church and Loosli (1953); but in the type of machine used in this laundry we found no evidence of this.

## THE PATIENTS AND STAFF

In May, 1952, swabs were taken from the nose and hands of all the surgical patients and from all the staff in the surgical wards and operation theatre. The results are summarised in the first line of table IV. This table shows that the *Staph. aureus* carrier-rate, and the proportion of persons in the hospital carrying penicillin-resistant strains, is greater than that for the general population. This is a well-known phenomenon and has been described by several authors. It is particularly significant that half of the hospital population were carrying *Staph. aureus* of the phage-types which caused most of the infections, and which were easily recoverable from the air and dust of the hospital. Dr. R. E. O. Williams tells us that these types do not form a large proportion of the strains isolated from persons outside hospitals.

TABLE IV—NOSE AND SKIN CARRIAGE OF *Staph. aureus* AMONGST PATIENTS AND STAFF BEFORE AND AFTER REORGANISATION

| — | Persons examined | Staphylococcus found in | | | | Persons carrying | |
|---|---|---|---|---|---|---|---|
| | | Nose and skin | Nose only | Skin only | Total | "Hospital types" | Penicillin-resistant strains |
| May, 1952 .. | 50 | 20 | 7 | 10 | 37 (74%) | 25 (50%) | 21 (42%) |
| December, 1952 | 40 | 7 | 7 | 1 | 15 (37·5%) | 1 (2·5%) | 8 (20%) |

## THE OPERATION THEATRE

*General Construction and Ventilation*

A plan of the theatre suite is shown in fig. 2. The two theatres and the sterilising-room were ventilated by a plenum system which delivered filtered and heated air at ceiling level. This plant was designed to deliver into each room eight changes of air per hour. In the main theatre air was extracted by fans at both ceiling and floor levels. These extractor-fans were intended to remove only two-thirds of the incoming air so as to ensure a positive pressure in the theatre. The situations of the air inlets and outlets in the main theatre are shown in the figure.

*Equipment*

A good deal of apparatus was normally kept in the theatre. Some of this was used infrequently and the cleaning of it made heavy demands on the staff.

The main *lamp* was suspended from the ceiling in the usual position over the table, and could be tilted during an operation. We thought it possible that when this was done dust particles which had settled on it might roll off into the wound. Gissane (1953) has drawn attention to this danger.

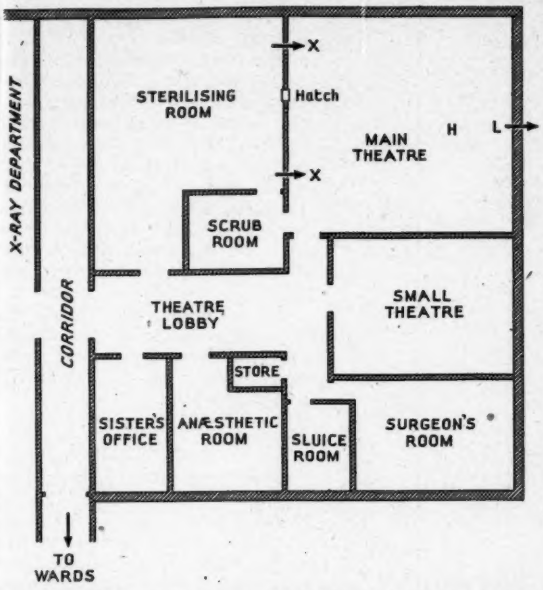



**Fig. 2—Plan of operation theatre unit. X = sites of high-level air inlets in main theatre. H = site of high-level air outlet in main theatre. L = site of low-level air outlet in main theatre.**

During an operation, blood and sometimes pus was aspirated with a *sucker*, an electrically driven pump being used to evacuate a glass bottle into which the material was drawn. On one occasion, when an empyema was being evacuated, it was noticed that the pus entered the bottle in the form of a coarse spray, and it was thought likely that some of this spray might pass through the pump and out through the exhaust outlet into the air of the theatre. A few experiments with liquid cultures soon showed that this, in fact, did happen with certain types of pump, and might therefore lead to serious contamination of the theatre air.

*Cleaning and Sterilisation of Instruments*

Used instruments were washed and then sterilised by a nurse working in the sterilising-room. This handling of potentially infected and of sterilised instruments in the same room, and often by the same person, seemed unwise.

Sterilising techniques were examined. Although no serious faults were found, the device fitted to the autoclave for recording the time and pressure was not working; so defects which might develop in the apparatus could pass unnoticed.

*The Clothing of the Staff*

The surgeons and table nurses changed from their everyday outer garments into freshly laundered cotton clothing before entering the theatre and putting on sterile gowns. But some anæsthetists, nurses, and porters did not change in this way. We felt that the clothing of hospital staff might contain pathogenic staphylococci, and we were able to demonstrate that in some instances this was true. Duguid and Wallace (1948) showed that an ordinary surgical gown could not be relied on to prevent the dissemination of organisms from underlying infected clothing.

Not all the masks in use contained a layer of impervious material as recommended in the M.R.C. memorandum of 1941 and by Devenish and Miles (1939). The value of an impervious layer is that it reduces the projection of droplets during speech.

Glove punctures were common and often passed unnoticed during the operation. Tests suggested that more than half of the gloves used by the surgeons and their immediate assistants became punctured.

*Movement of Staff during Operations*

Careful observation of staff during operations showed that a good deal of unnecessary movement took place. We noticed that nurses and porters tended to rush about when engaged on urgent duties and to wander about when unoccupied. Bourdillon and Colebrook (1946) have already shown that the passage of a gowned person across a room causes an appreciable rise in the number of airborne organisms. We have confirmed this observation.

During an operation lasting one and a half hours the doors between the theatre and the sterilising-room or corridor were opened 66 times. Repeated observations in this and in other theatres showed that this was not unusual. Nurses frequently went to fetch equipment which could have been brought in before the operation started, or removed equipment which could well have remained in the theatre until the operation had finished. Some of the journeys served no apparent purpose at all. Anæsthetists sometimes left and returned to the theatre several times during an operation and often bobbed about in an undesirable way. The opening and closing of a door in an operation theatre causes an immediate rise in the number of airborne organisms. It does this firstly by causing a draught which raises particles from the floor, and secondly by allowing contaminated air to enter the theatre from the adjacent room or corridor.

There was sometimes more talking than seemed desirable, especially if no senior member of the surgical staff was present. The talking, usually by those in the immediate vicinity of the wound, was sometimes continuous and often of a social rather than a technical nature.

*The Handling of the Patient*

When the patient reached the theatre unit he was taken to the anæsthetic room and anæsthetised on the trolley. He was then wheeled into the theatre, lifted on to the table, turned into the required position and covered with the blankets from the trolley. These procedures, as will be shown, were followed by an enormous rise in the number of airborne organisms. At the end of the operation the patient's bed was brought into the theatre and he was lifted into it directly from the table.

At the beginning and end of operations for resection of the lung, bronchoscopy was often performed in the theatre. During bronchoscopy the patient coughed a good deal, and as a result heavy contamination of the theatre air appeared to be inevitable.

*Air Sampling*

Bearing in mind the work of Bourdillon and Colebrook (1946) we felt that the main investigations here should consist in air sampling during operations. These showed that conditions were far from satisfactory and that the counts did not fall within the limits suggested by Bourdillon and Colebrook.

Fig. 3 shows that very high plate counts were obtained immediately after the arrival and departure of the patient, and that during the quieter periods of the operation the counts were well above the 2·0 colonies per c. ft. recommended by Bourdillon and Colebrook. From 95 c. ft. of sampled air 21 colonies of *Staph. aureus* were isolated (1 colony to 4·5 c. ft. of air); this seemed to us to represent a dangerous degree of contamination.

Culture plates exposed in different parts of the theatre during an operation showed that infected particles were settling at the rate of 5·1 per sq. ft. per min.

The "die-away" rate of airborne organisms in the theatre indicated that the effective ventilation did not exceed two to three changes per hour, which was very much less than the intended capacity of the plant. Furthermore, smoke tests showed that air flowed into the theatre from the lobby and corridor, and not in the reverse direction as was intended. A fluorescent powder scattered in the corridor was detected within a few minutes by an

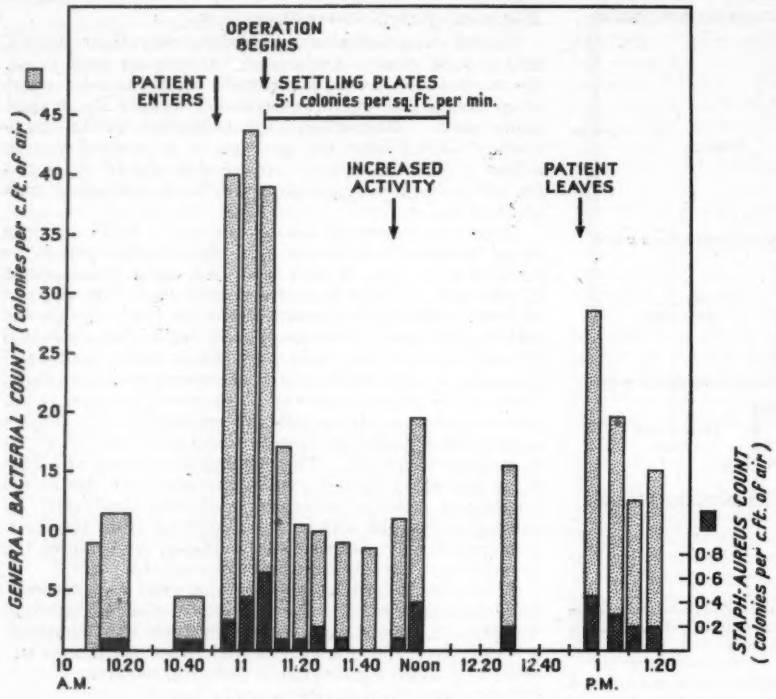



Fig. 3—Air-sampling in theatre before reorganisation.

ultraviolet lamp inside the theatre. The speeds of the fan motors were then checked, and it was found that the extractor fans were removing more air than was being delivered by the inlet fan, thus accounting for the flow of air into the theatre from the corridor. After much inquiry it was discovered that alterations to the plant had been made by an engineer who did not realise the need for a proper relation between the air inlet and outlet rates.

We also felt that the situation of an air outlet in the ceiling at the same level as the inlet was a bad arrangement. Smoke tests confirmed this opinion, for they showed that most of the incoming warm air passed across the ceiling and out through the high-level outlet, having made little or no contribution to the ventilation of the main body of the room.

## CONCLUSIONS

These investigations led us to believe that infection of the air in the wards and operation theatre was a likely cause of the high rate of wound infection.

## Remedial Measures

The surgical wards were closed, cleaned, and redecorated, and all the bedding autoclaved. Plans were made to modify each of the hospital procedures which seemed likely to be responsible, even in a minor degree, for the spread of infection. These modifications were explained to the doctors and nurses in a short series of lectures, in which each proposed change was supported by reference to the bacteriological findings. The recommended procedures were then set out in the form of a pamphlet which was issued to all medical and nursing staff. We think it is essential that the approved methods for hospital procedures should be available to junior staff in written form; for otherwise there is a tendency for minor modifications to be introduced without the permission or knowledge of the senior staff.

Of the changes made we shall mention the more important.

### THE WARDS

*Cleaning Methods*

The ward dusting was done with a wet cloth. Wooden floors were oiled with "Puremor 210"† and were re-oiled every three weeks. This led to a noticeable reduction in the spread of dust when the floors were swept. Terrazzo floors cannot be satisfactorily oiled and dust was removed from these with vacuum cleaners; brooms were not used.

No attempt was made to sterilise walls and floors. Scrubbing and washing, when necessary, were done with ordinary soap and water.

*Bedding*

Nurses were asked to wear gowns when making beds and to handle the bedding with as little disturbance as possible. Blankets were moved gently rather than flung about, and mattresses were turned over rather than thrown over.

All wards were equipped with linen blanket-covers which were so designed that all the top blankets of each bed were completely enclosed. These covers replaced the normal top sheets and were changed weekly.

Whenever blankets were removed from a bed on the discharge, transfer, or death of a patient they were sent to the laundry for sterilisation, washing, and oiling before being returned to the ward. Patients who remained in hospital for more than three months were given fresh blankets at the end of that time. We originally recommended that this be done every two weeks; but, because the supplies of blankets and the available laundry and sterilising facilities were insufficient to meet this demand, we had to accept the longer interval.

Pillows and mattresses were sent for sterilisation at the same times as the blankets.

Bedding was taken to the laundry in canvas bags, unsorted and uncounted, so as to reduce the dissemination of organisms in the wards.

*Wound Dressing Techniques*

The advantages of dressing wounds in a specially designed and plenum-ventilated dressing-room have already been pointed out (Bourdillon and Colebrook 1946, Colebrook et al. 1947, 1948); but, as it was not immediately possible to provide such rooms, dressings continued to be done in the wards. The recommended technique was that described for one dresser and one assistant in M.R.C. War Memorandum no. 6 and summarised in M.R.C. Memorandum no. 11. Salient points were emphasised in the ward instruction sheets.

*Sterilising Methods*

Metal instruments, syringes and needles, bowls, dishes, and rubber articles were boiled for five minutes immediately before use. Thermometers were kept in liq. boracis et formaldehydi, each patient having his own thermometer. Baths were cleaned with cetrimide immediately after use. Patients' handkerchiefs were discarded into 2% cresol solution. Crockery was not sterilised but was washed with soap and very hot water, then rinsed in clean hot water. The washed articles were left to drain and dry; drying-cloths were not used (Higgins and Hobbs 1950).

† Manchester Oil Refinery.

*Handwashing*

Members of the staff were asked to wash their hands before starting work at the beginning of each spell of duty, before leaving the ward at the end of a spell of duty, before preparing patients' meals, before and after doing dressings, after attending to a patient's nasal or oral toilet, after dealing with excreta, after collecting material for pathological examination, after handling or emptying sputum mugs, after bedmaking, after sneezing or blowing the nose, after using the toilet and whenever else common sense suggested that the hands may have become contaminated.

For most of these purposes an ordinary "social wash" was deemed adequate; but at the beginning of each day, and before doing dressings, fingernails were scrubbed thoroughly and the hands were scrubbed lightly with a soft brush. It was emphasised, however, that this will not sterilise the hands, and that regular vigorous scrubbing with a stiff brush makes the hands rough and more liable to carry infection. After being washed, hands were always dried, and the old practice of doing dressings with wet hands was forbidden.

Members of the staff with staphylococcal lesions on the hands and forearms were not allowed to remain on duty in surgical wards.

*Preparation of Patients for Operation*

On the evening before operation the patient's head was washed and the skin of the operation area was shaved if necessary. No disinfectants were applied to the skin at this stage, since there is no substance available which will keep the surface of the skin sterile for more than a few hours. On the day of his operation the patient was given a bath or, if he was unable to go to the bathroom, a blanket-bath. This was arranged so that it was finished about an hour before the time of the operation. After the bath the patient did not return to the ward or his own bed, but went on a trolley to a "preparation room," where the skin of the operation area was cleaned with 0·5% aqueous cetrimide solution, dried with surgical spirit then ether, and painted with 1–2% iodine in 70% ethyl alcohol. Gardner and Seddon (1946) and Gardner (1948) have shown that iodine is the most effective of the usual skin disinfectants. A 2% solution is bacteriologically preferable, but skin reactions are less common if a 1% solution is used. The area was not bandaged and the patient was dressed in a freshly laundered operation gown or pyjama suit and a cap which completely covered the hair. He then waited on the trolley in the preparation room until he was taken to the theatre.

During his absence, the patient's bed was stripped, wiped over with 2% cresol, and remade with autoclaved mattress, pillows, and blankets, and freshly laundered sheets.

*The Use of Antibiotics*

The routine penicillin cover for "clean" operations was abandoned; but, before some operations involving the division of a bronchus, suitable antibiotics were used. Established pyogenic infections were treated with antibiotics to which the responsible organisms were found to be sensitive, whilst streptomycin, of course, continued to be used for the treatment of tuberculosis.

*Isolation of Infected Patients*

A special "emergency ward" was set aside for the reception of infected patients. It was, fortunately, possible to use for this purpose part of a building separate from the main surgical block.

Patients were transferred to it when infection seemed likely on clinical grounds, without waiting for bacteriological confirmation. The nursing and domestic staff looking after these patients were not allowed to work in any other part of the hospital.

THE LAUNDRY

Articles were sorted and counted after arriving at the laundry. Blankets were autoclaved at a pressure of 5 lb. per sq. in. for thirty minutes before being washed. The washing process remained as before, but care was taken that the canvas bags in which the articles were transported were themselves washed. After washing, blankets were treated with an anionic self-emulsifiable oil (Leslie 1953). The washed articles were returned to the wards in baskets which were never allowed to be used for dirty laundry.

THE OPERATION THEATRE

*Ventilation*

The faults in the ventilation plant were rectified and the ceiling air-outlet was closed. Twelve room-changes of air per hour were provided and smoke tests showed that no air entered the theatre unit except by the inlet ducts. At all leak points the flow was outwards.

*Equipment*

No more apparatus than was necessary for the operation was kept in the theatre. All major items of equipment were wiped with 2% cresol solution each day and the surfaces of the theatre lamp were smeared with liquid paraffin to immobilise dust particles.

The sucking machines were modified so that the exhaust was conveyed through rubber tubing and a brass pipe in the window-frame to the outside air.

*Cleaning and Sterilisation of Instruments*

Used instruments were washed in the sluice-room and boiled before being taken to the sterilising-room. The faulty recording device on the autoclave was repaired so that the theatre-sister had a permanent record of the temperature, pressure, and duration of each sterilising operation. Regular bacteriological checks on the efficiency of the autoclaves were made.

*The Clothing of the Staff*

It was arranged that no person would enter the theatre during an operation session without first changing into freshly laundered cotton clothing, and putting on theatre boots, gown, cap, and a mask containing cellophane. Female members of the staff made sure that all their hair was covered by their caps.

The surgeon and his assistants scrubbed their fingernails with a soft brush and then washed their hands for ten minutes before drying them with spirit and a sterile towel and putting on gloves. If a glove was known to be punctured during an operation another was immediately put on over it. Some surgeons wore thin cotton gloves over the rubber ones in the hope that this would reduce the number of punctures. These precautions were considered important but in spite of them unsuspected punctures remained numerous.

*Movement of Staff During Operations*

During the operation movement of staff was reduced to a minimum, and to encourage this seats were provided for all occupants of the theatre.

Some of the dangers of opening theatre doors during an operation can be reduced by the use of air-locks. But we preferred to forbid the opening of doors during the period of exposure of the wound. At first it was objected that this would be impossible, but once the nursing staff had accustomed themselves to the idea they found no difficulty in making their preparations accordingly.

Talking was reduced to a minimum.

*Handling of the Patient*

When the patient reached the theatre unit, he was transferred to the operation table which was waiting in the anæsthetic room. He was then covered with a large piece of freshly-laundered turkish towelling. We preferred this to blankets because it may be boiled and is thus sterilised during the normal laundry process. Even when

not sterile it is less liable to scatter infected particles than is a woollen blanket. The taking of blankets into the theatre was strictly forbidden; and we believe that this is a rule of great importance which should be applied in every operation theatre.

The patient was anæsthetised on the table and, *whilst still in the anæsthetic room*, was turned into the required position for operation. The theatre doors were then opened gently and the table was pushed slowly in with a minimum of fuss. This routine was designed to avoid the manipulation of the patient and his coverings inside the theatre.

The patient's skin was painted with 1–2% alcoholic iodine. This was applied three times and each application was allowed to dry before the next was applied. We had no reason to believe that three applications were more effective than one, but this routine ensured that the iodine was allowed at least three minutes in which to act.

After the operation, bronchoscopy, if necessary, was performed in the small theatre. Transfer of the patient from the table to his bed or to a trolley was done in the lobby. These procedures were never carried out in the main theatre.

## Results

After the hospital had been working to the new routine for a year, the situation was reviewed, and some of the bacteriological investigations were repeated.

### *The Wards*

Floor dust was examined as before. *Staph. aureus* could still be isolated, but only occasional colonies were found, 3 being the greatest number seen on any one plate.

The load of organisms in used blankets was much reduced. *Staph. aureus* was still easily isolated from the blankets of some patients but the number of blankets yielding this organism was very small.

Air sampling revealed a striking reduction in the numbers of airborne *Staph. aureus*. From 320 c. ft. of air collected in representative parts of the surgical wards and corridors, 3 colonies of *Staph. aureus* were isolated. This represents 1 colony to 106 c. ft. of air and compares well with 1 to 2·9 c. ft. obtained a year earlier. Of the 3 colonies isolated, 1 was resistant and 2 were sensitive to penicillin.

### *The Patients and Staff*

Nose and skin swabs taken six months after the reopening are shown in table IV. The *Staph. aureus* carrier-rate was almost halved, and there was a striking reduction in the frequency of the types previously prevalent. When swabbing was repeated after twelve months' work under the new conditions, the results were essentially the same as those at six months; but on this occasion phage-typing was not done.

### *The Operation Theatre*

Air sampling was done on numerous occasions during the twelve months after the reorganisation. An immediate improvement was observed and this was maintained during the year. Fig. 4 shows the results from one of these samplings. During the whole series 27 colonies of *Staph. aureus* were isolated from 1390 c. ft. of air. This represents 1 colony to 51 c. ft., compared with 1 colony to 4·5 c. ft. during our first observations. The settling rate of infected particles was 0·6 per sq. ft. per minute.

TABLE V—INFECTION-RATES AFTER REORGANISATION

| Year | No. of major operations | | | | No. of infections |
|---|---|---|---|---|---|
| | Thoraco-plasty | Lung resection | Other | Total | |
| August–December, 1952 .. .. | 95 | 25 | 16 | 136 | 7 (5·1%) |
| 1953 .. .. | 346 | 86 | 4 | 436 | 17 (3·9%) |
| 1954 .. .. | 284 | 83 | 20 | 387 | 24 (6·2%) |

### *Infection-rates*

Comparison of table V with table I shows an immediate reduction in the infection-rate. During the latter part of 1952 the rate was about half that recorded at the beginning of the year. A further small but welcome reduction followed in 1953 and continued into 1954, until a sharp outbreak of 9 infections occurred during a period of eight weeks. The outbreak coincided exactly with the attendance in the theatre of an assistant who was temporarily a nose and skin carrier of *Staph. aureus* of bacteriophage type 79. This was the type isolated from each of the 9 infected patients. It had not been isolated before and only appeared once again after the assistant concerned had been freed from it. Apart from these 9 cases, the infection-rate in 1954 was almost exactly the same as that in 1953.

## Discussion

We do not believe that our experience of wound infection is an isolated one: the problem probably arises in many surgical units, and the excellent surveys of staphylococcal infection by Howe (1954) and Spink (1954) show that it is not restricted to this country.

The first important point which we had to decide was whether the wounds became infected at the time of operation or afterwards in the wards. It is possible that during the earlier period, when sepsis became apparent two to three weeks after operation, ward infections were responsible. It is also possible, however that at that time penicillin was still sufficiently effective against the prevailing organisms to delay sepsis which it was not able to prevent. The progressive shortening of the interval between operation and sepsis could be due to the waning efficacy of penicillin against these infections; or alternatively to a steady increase in the virulence of the responsible organisms as a result of serial passage through the human subject. We have no evidence to support either of these hypotheses; nor have we any other explanation to offer.

It did seem that, in 1952 at any rate, infection in the theatre was more likely, because symptoms and signs of infection usually appeared about the fourth day after operation. Dressings were not normally changed until the tenth day (when the stitches were removed), and until this time the wound was well sealed with adhesive plaster. Moreover, it seemed unlikely that an infection acquired in the ward would penetrate from the surface of the skin into the deep spaces of the chest without giving rise to signs of infection in the superficial parts of the wound. We do not exclude the possibility of wounds becoming infected in the ward and we have noted the absence of efficient isolation of patients and dust-suppression in the wards. But we believe that these mainly acted by permitting the earlier septic wounds to infect bedding and the noses and skins of patients and staff, thus

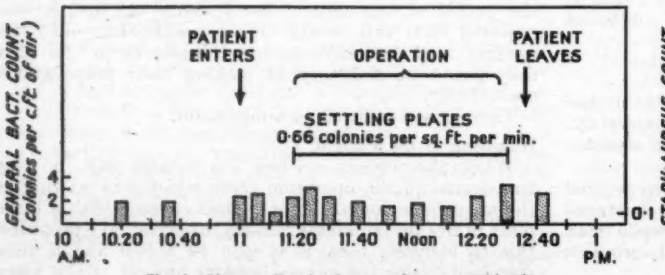



Fig. 4—Air-sampling in theatre after reorganisation.

providing an increasing reservoir of dangerous organisms. We therefore did all in our power to reduce the dissemination of bacteria in the wards. The measures adopted were probably responsible for the observed reduction in the *Staph. aureus* carrier-rate, and they may have reduced the numbers of airborne organisms which reached the theatre by way of the corridors.

Our next problem was to decide what was the mechanism by which the organisms entered the wound. Our reasons for believing that airborne infection was of prime importance were based on the observations (1) that bacterial counts on the theatre air were very high, and (2) that until 1954 we were not able to find any consistent association between the infecting organisms and a surgeon (or assistant) who was a known skin carrier. Furthermore, there was no evidence of a serious breakdown in the traditional surgical aseptic techniques, or in the theatre sterilising methods. We therefore directed our attention to reducing the numbers of airborne organisms in the hospital in general and the operation theatre in particular. The immediate results seemed to justify this action.

We could find no explanation for the 1954 incident other than contact infection from the known carrier. We did not, however, determine the mechanism of this contact. No special precautions such as those evolved by Devenish and Miles (1939) were being taken at that time to prevent infection through the sleeves of the gown and we think that this fault may have been responsible, although the surgeon concerned (a nose and skin carrier of the responsible organism) had no demonstrable septic lesion.

This incident was important because it reminded us that whilst our attention has been focused on airborne infection we had overlooked another method of infection which had already been described. We draw attention to this point because investigations in several other surgical units show that insufficient attention has been paid to the important paper of Devenish and Miles. We agree with these writers that the sleeves of a surgeon's gown should be waterproof, though we have not yet found a satisfactory way of achieving this with any comfort. The passage of skin organisms through unsuspected glove punctures is also a possibility, and we regard this problem of glove punctures as serious. Many surgeons are known to be skin carriers of *Staph. aureus*, and our observations suggest that they must often perform operations during part of which they are wearing punctured gloves. We have evidence suggesting that the punctures sometimes occur as a result of a shearing strain rather than a direct prick. The solution seems to lie in the use of thicker gloves, but we suggest that manufacturers should give urgent attention to the production of a better quality glove.

The fact that many of the infecting organisms were resistant to penicillin was probably due to the large amounts of penicillin which were being used as a routine for all operation patients. This explanation is supported by our more recent observations, not reported here, that the proportion of resistant strains from these sources is declining now that the routine administration of penicillin has been stopped. Association between the prevalence of resistant organisms and the amount of antibiotic used was pointed out by Clarke et al. (1952).

The sterilisation of blankets by steam was very effective and continued throughout the period reviewed in this paper. It did, however, prove expensive because of serious damage to the blankets which shrunk and "felted" very badly. More recently heat sterilisation of blankets has been abandoned in favour of a method using a quaternary ammonium compound in conjunction with normal laundering. This method (Blowers and Wallace 1955) is so far proving satisfactory.

In calculating the incidence of infection for each year we have included all instances in which *Staph. aureus* was isolated. When the rates of infection before and after the reorganisation are compared (tables I and V) an important point has to be borne in mind. During the period before the reorganisation and before the hospital had become "infection conscious" only the major infections were investigated and recorded in the patient's notes. After the hospital was reopened every sign of infection, no matter how trivial, was investigated and recorded. In some instances *Staph. aureus* was isolated on only one occasion from a small area of redness in a wound. This difference of approach during the two periods will, of course, tend to reduce any apparent success in the prevention of infection. In an attempt to assess this inconsistency we have tried to estimate how many of the recent infections were of such a nature that they might have been missed if they had occurred during the earlier period. The proportion, we think, is about a fifth.

We believe that the reduction in the incidence of infection was due to the measures taken. The most important of these, in our view, were the isolation of infected patients, the regular sterilisation of all hospital bedding, improvement in the ventilation of the operation theatre, and the exclusion of blankets from the theatre. In spite of the precautions here described occasional infections still occur and more investigation will be necessary before they can be prevented. Meanwhile, however, we are sure that the line we are taking, in relying on strict asepsis, is the correct one. We believe that it will ultimately be more rewarding than the liberal use of antibiotics—a practice which, if continued, may lead to the widespread distribution of strains of organisms resistant to all the agents at our command.

## Summary

In a chest surgery unit the infection of wounds, including intrathoracic spaces, with penicillin-resistant *Staphylococcus aureus* became so frequent that in 1952 it was necessary to close the unit.

Many patients and members of the staff were nose and skin carriers of the responsible organisms.

*Staph. aureus* was easily isolated from air and dust in the wards and corridors. This was mainly attributed to the lack of isolation facilities for infected patients and the use of unsterilised blankets.

In the operation theatre general bacterial and *Staph. aureus* counts on air sampled during operations were high. Inefficient ventilation, the use of blankets in the theatre, and excessive activity of the staff contributed to this unsatisfactory state of affairs.

As a result of these investigations it was considered that most of the infections occurred at the time of operation and that the infecting organisms were airborne.

Correction of faulty procedures was followed by a reduction in the infection-rate from at least 10·9 to 3·9%. The *Staph. aureus* carrier-rate among patients and staff fell from 74 to 37%. Later, the infection-rate rose to 6·2% possibly because insufficient attention had been paid to the prevention of infection from the surgeon's skin.

Infections cannot be prevented indefinitely by the liberal use of antibiotics, and these should not be used as a substitute for scrupulous aseptic technique.

We are greatly indebted to the late Dr. R. Cunningham who provided the facilities for much of this work. We also wish to thank Dr. W. G. Patterson and Dr. G. S. Wilson for their interest and helpful advice; Dr. S. Wray for his assistance, especially during the early stages of the investigation; the members of the surgical teams for their many suggestions and their whole-hearted coöperation; the nursing staff of the hospital and, in particular, Sister Gladys Jones for the thoroughness with which they carried out our suggestions; Dr. R. E. O. Williams for the phage-typing, for the first air-sampling, and for the loan of a slit-sampler; Mr. W. H.

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# INTERMITTENT CLAUDICATION AND SYMPATHECTOMY

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SENIOR SURGICAL REGISTRAR, ABERDEEN ROYAL INFIRMARY

OCCLUSION of the main vessel of the lower limb secondary to atheroma is commonly segmental (Leriche et al. 1937) and in the great majority of cases affects the femoral artery in Hunter's canal (Lindbom 1950, Krahl et al. 1954, Lowenberg 1954, Mavor 1955). In a smaller proportion of cases the popliteal artery is the site of the initial thrombosis (Lindbom 1950, Mavor 1955). It is only under these conditions of limited main-vessel thrombosis that the collateral circulation forms an adequate by-pass (Learmonth et al. 1944), returning a distal pulse to the main vessel, with the result that blood reaches the periphery at high pressure and with a good volume flow (Learmonth 1950). Thus the resting nutritional needs of the limb are met, and symptoms limited to periods of exercise. In these circumstances the classical exercise symptom is intermittent claudication, with pain in the calf muscles (Bouley 1831, Brodie 1846). With propagation of the main-vessel thrombosis to involve both femoral and popliteal arteries in continuity, rest pain and ischæmic changes in the foot arise, but intermittent claudication remains the dominant complaint in half the cases (Mavor 1955).

Until recently the treatment of intermittent claudication with pain in the calf has resolved itself into an endeavour to improve the collateral circulation, the most effective way of doing so being by lumbar sympathectomy. However, it has always been questionable whether this operation is worth-while in the treatment of exercise pain itself, and when it is undertaken its justification often lies in its probable effect on other manifestations of the disease. With the recent advent of direct surgery for the occluded artery (Hufnagel and Eastcott 1950, 1951, 1952, Fontaine and Hubinont 1950, Julian et al. 1952, Rob and Eastcott 1953), with its particular application to cases of segmental main-vessel thrombosis, the place of sympathectomy in treatment demands re-examination.

## General Considerations

There is no doubt that lumbar sympathectomy has been used in treating intermittent claudication in atheroma with secondary thrombosis without regard to the extent or the site of the thrombosis or the collateral circulation. There has been no attempt to correlate the results of operation with the level of the main-vessel block (*British Medical Journal* 1952), although the results of sympathectomy are said to be better where the thrombosis is highly placed (Telford and Simmons 1946). As regards the collateral circulation, for a considerable period after an episode of main-vessel thrombosis, possibly as long as six months (Silbert 1938, Boyd, Ratcliffe, Jepson, and James 1949, Hamilton and Wilson 1952), exercise tolerance may show progressive improvement as the collateral circulation develops. Sympathectomy should probably not be undertaken during this period (Learmonth 1950); if it is, assessment of its effect will be difficult.

There are other difficulties in postoperative assessment. The operation itself cannot be "standardised," because of the anatomical variations in the sympathetic chain; and, though most investigators (Leriche and Stricker 1933, Learmonth et al. 1944, Pearl and Michels 1952, Atlas 1953, Lilly et al. 1954) are now agreed that the first lumbar ganglion should be removed along with the chain down to the level of the aortic bifurcation, these variations, in particular the presence of ganglia within the psoas muscle (Boyd and Monro 1949), make so-called "inadequate" sympathetic denervation at times unavoidable.

Probably the greatest problem lies in acquiring a reliable postoperative yardstick with which to measure improvement. Intermittent claudication is a variable subjective symptom and cannot be considered an accurate index of peripheral muscle ischæmia. Nevertheless, as it is the symptom under treatment, assessment must relate to its general trend postoperatively. This may be more readily determined over a period of time on the basis of the patient's own observations than by the employment of exercise-tolerance tests made under controlled conditions or with artificial aids (Boyd et al. 1949, Shepherd 1950, Hamilton and Wilson 1952).

## Present Investigation

Taking these points into consideration I have studied the effect of lumbar sympathectomy on intermittent claudication with pain in the calf in 54 cases of main-vessel thrombosis secondary to atheroma, where (on the basis of arteriography) the site and the extent of the thrombosis were known preoperatively.

A complete clinical examination, with analysis of urine, blood Wassermann and Kahn tests, a full blood-count, estimation of blood-urea, radiography of the chest and legs, and electrocardiography, has been done in each case. No abnormalities were found. Femoral arteriography was done in 51 cases, and the diagnosis was based on the clinical and arteriographic findings, supported in every case by exploration and examination of the main artery of the limb, either femoral or popliteal, with occasional confirmation in difficult cases from histological examination of thrombosed arterial segments. In the 3 other cases a diminished or absent femoral pulse necessitated aortography, and no main vessel was explored.

The main symptom in all the cases was intermittent claudication with pain in the calf. This was unilateral in all the cases and had been present for at least six months. The exercise pain was considered stationary, exercise-tolerance tests carried out twice daily in hospital for several days preoperatively confirming this impression. Pain was of the classical type, increasing in severity with walking until the patient found it necessary to rest, when the pain was relieved.

The distribution of age and sex was as follows:

| *Age (yr.)* | *Male* | *Female* |
|---|---|---|
| 31–40 | 3 | .. |
| 41–50 | 8 | .. |
| 51–60 | 26 | 3 |
| 61–65 | 13 | 1 |

Other symptoms included pallor and coldness on exercise, noted in the foot of the affected leg in 40 patients. Muscle wasting and hypotonia were not prominent, although terminal pulp atrophy was noted in several cases. No patients had any clinical evidence of ischæmia of the skin at rest, and none suffered rest pain.

In no case was sympathectomy done within six months of the onset of exercise pain. The operation was performed through a transverse incision lateral to the umbilicus, with an extraperitoneal approach. The sympathetic chain between the second lumbar vertebra and the aortic bifurcation was removed. In each case sympathetic resection was confirmed by histological examination of the segment removed. No case is included in the study where the adequacy of the sympathectomy was in doubt either at operation or postoperatively, and all the cases showed a postoperative rise of 6–13°C in the temperature of the skin on the great toe and dorsum of the sympathectomised foot.

The follow-up took the form of a questionnaire and personal interview undertaken from one to five years after operation. No precise attempt at exercise tolerance was made, and the observations on the postoperative severity of exercise pain are the patient's own, concluded over a long time.

### Questionnaire

*Question A.*—Has there been any change in your leg pain since operation ?

*Question B.*—Can you now walk farther without leg pain ?

*Question C.*—Is the leg pain, when present, less severe than before operation ?

*Question D.*—If less severe, does the leg pain still require you to stop and rest ?

All the patients were asked to comment on their answers, and thereafter an attempt was made to classify results. The four following groups of patients were recognised :

*Group 1.*—The result was considered good. In this group an affirmative reply to questions A, B, C, and D was obtained in each case. There was an important and significant increase in the patient's exercise tolerance, so much so that the patient was highly gratified with the result of the operation. When pain was present, it was less severe, enabling him to walk farther with pain.

*Group 2.*—The result was considered moderate. A negative reply was obtained to question B, an affirmative one to the others. There was no significant change in exercise tolerance, although the pain, when present, was less severe The patient was disappointed with the result of the operation

*Group 3.*—In this group exercise pain was regarded as being unchanged since operation.

*Group 4.*—Here exercise pain had become more severe since the operation.

### Results

The results are summarised in the accompanying table. No case was noted to be completely relieved of exercise pain in the calf. Of the 54 patients only 9 (17%) had a significant improvement in exercise pain, meaning that the patient's activities as regards work and pleasure were favourably affected. The remaining 45 patients (83%) were either improved to an insignificant degree, unaltered, or made worse by the operation. 3 patients thought that their exercise pain was more severe than before operation, but in all 3 this was due not to an increase in the severity of the calf pain but to the addition of severe exercise and rest pain in the thigh to their symptoms. This is a well-known aftermath of sympathectomy (Learmonth 1950, Hamilton and Wilson 1952) ; its cause is not fully understood.

The collateral circulation forms a by-pass, and its efficacy depends on the height to which it refills the main artery (Learmonth, Blackwood, and Richards 1944). Thus the extent of the thrombosis is a measure of the efficiency of the collateral circulation. In theory, then, it might be thought that patients with a good collateral

RESULTS OF LUMBAR SYMPATHECTOMY IN 54 CASES OF INTERMITTENT CLAUDICATION WITH CALF PAIN

| Site and extent of thrombosis | Group 1 (good result) | Group 2 (moderate result) | Group 3 (unchanged) | Group 4 (more severe) |
|---|---|---|---|---|
| Aortic bifurcation and right common iliac | .. | .. | 2 | .. |
| External iliac artery and common femoral .. .. | .. | .. | 1 | .. |
| *Superficial femoral artery :* | 6 | 16 | 16 | 3 |
| Upper third .. | .. | .. | 1 | .. |
| Lower two-thirds | 2 | 4 | .. | 1 |
| Lower third .. | 2* | 3 | 7* | .. |
| Whole femoral† .. | 2 | 9 | 8‡ | 2 |
| *Popliteal artery :* | 2 | 4 | 2 | .. |
| Short proximal thrombosis .. | .. | 1 | 2 | .. |
| Long thrombosis | 2 | 3 | .. | .. |
| Femoropopliteal thrombosis .. | 1 | 1 | .. | .. |
| Total .. .. | 9 | 21 | 21 | 3 |

* Includes 1 female case.
† Femoral artery from profunda femoris origin to adductor magnus opening area.
‡ Includes 2 female cases.

circulation and short thrombosis would fare better after sympathectomy. In 16 patients in this series the length of the main-vessel occlusion was 3 inches or less. Of 13 patients with short femoral-artery thrombosis only 2 benefited from operation, and of 3 with short popliteal thrombosis none was significantly improved. On the other hand, 1 patient with femoropopliteal thrombosis, the occlusion extending from the origin of the profunda femoris artery to the distal popliteal artery, and 2 patients with complete thrombosis of the superficial femoral artery were significantly improved. Likewise in 2 patients with thrombosis involving the whole length of the popliteal artery the result was good, an unexpected finding in view of the poor collateral circulation and the distal site of the obstruction. In contrast, 4 cases of high occlusion were unchanged postoperatively.

It seems that in this study the effect of sympathectomy on intermittent claudication with pain in the calf bears no relation to either the height of the obstruction or the extent of the thrombosis.

### Comment

In general terms Boyd et al. (1949) reported the effects of sympathectomy on intermittent claudication, obtaining " good improvement " in 37 of 63 patients. By " good improvement " is meant " complete relief from pain and ability to walk one mile without pain." Although such dramatic results have not been reported elsewhere general experience seems to indicate that some benefit is derived from sympathectomy in about half the patients treated (Telford and Simmons 1946, de Takats et al. 1946, DeBakey et al. 1950, Julian and Shabart 1950). These good results, however, are reported in the face of clinical and experimental evidence that after operation there is no alteration in the blood-flow to the calf muscles either at rest or after exercise (Learmonth 1950, Shepherd 1950).

In this study the effect of sympathectomy has proved clinically disappointing to both the patient and the surgeon. The benefit of the operation, if it is objective, should be related to an improvement in the collateral blood-flow, which in its turn depends on the extent of the occlusion, unless in those cases with short occlusions which gave an unsatisfactory response other factors, such as inadequacy of sympathectomy and the presence of disease in collateral vessels, prejudiced the result. So far as possible such variable factors have been excluded in this study. Nevertheless the so-called beneficial effect

of sympathectomy on intermittent claudication has remained haphazard and entirely unpredictable. Thus it seems probable that the improvement in calf exercise pain which may follow sympathectomy in a small proportion of cases is subjective and not related to the nature of the operation, although it is conceded that the warmth of a sympathectomised foot will probably further enhance subjective improvement in intermittent claudication.

The question arises whether, in cases of segmental thrombosis secondary to atheroma, the operation would not be better deferred until a more suitable time, because there is little doubt that the dramatic effects of the operation are related to the subcutaneous vessels and the state of the skin. In a limited main-vessel thrombosis, particularly of the femoral artery, sympathectomy will not greatly affect the propagation of the thrombus, which is the method of progression of the disease (Mavor 1955) and depends so much on anatomical factors, on the state of the main vessel as regards the distribution and severity of the atheromatous changes, and on the involvement or otherwise of the main arteries below the knee. It seems reasonable to suggest that, where direct surgery is feasible as either a direct or shunt arterial homograft or autogenous vein graft, it should be undertaken, and in these circumstances sympathectomy not advised. Where direct surgery is not feasible, owing either to the local condition of the main artery and the extent and severity of atheroma or to cerebral, coronary, or renal manifestations of the disease, sympathectomy is advisable, provided it too is not contra-indicated as a surgical risk although it is likely to be a less hazardous operation. In such cases the prognosis as regards progression of the main-vessel thrombosis and gangrene is not good, and sympathectomy done at this time is not an attempt to treat claudication pain, but an effort to protect the skin, which will soon inevitably suffer as the disease progresses. Possibly an exception should be made in cases of segmental popliteal thrombosis in which the prognosis is undoubtedly more serious.

There is no doubt about the justification for sympathectomy in cases where there has been extension of the main-vessel thrombosis to involve both femoral and popliteal arteries in continuity. In such cases there is ischæmia at rest, manifest by skin changes and rest pain, in which sympathectomy often causes dramatic improvement. Intermittent claudication is present and, as has been stated, may in half the cases (Mavor 1955) still occupy the patient's main attention. Before operation the effect and likely benefit of sympathectomy should be explained to the patient. It should be particularly emphasised that his exercise pain may not be greatly affected, because only disappointment can come of high expectations in this direction.

### Summary

The effect of lumbar sympathectomy on intermittent claudication was studied in 54 patients, in whom the exact site and extent of the main-vessel occlusion, secondary to atheroma, was known.

Despite the difficulties of assessment, it is clear that the results of operation were unsatisfactory.

Lumbar sympathectomy is not worth while in the treatment of intermittent claudication itself. Where direct surgery is contemplated in cases of segmental main-vessel thrombosis in the lower limb, sympathectomy may be postponed until such time as its effects will be more obviously beneficial. A possible exception may be popliteal occlusion.

I am indebted to Prof. W. C. Wilson for his advice in the study of these patients, and to Mr. G. Gordon Bruce for his interest and encouragement.

*References at foot of next column*

# HYPOTHYROIDISM AND DIABETES MELLITUS

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TRUE idiopathic hypothyroidism and diabetes mellitus have seldom been reported as occurring in the same person.

In a survey of all patients submitted for estimation of their basal metabolic rate (B.M.R.) in six and a half years, I discovered 91 with idiopathic hypothyroidism (13 male, 78 female) of whom 4, all women, also had diabetes mellitus.

### Methods

All the B.M.R. estimations were carried out by the technique of Robertson (1944), which involves repeating the test until a steady level is obtained; this method gives satisfactory results in outpatients. The standards used during the survey were those of Aub and DuBois (1917); the experience of the department has been that the lower limit of normal by this method is −20% (Robertson and Reid 1952).

Glucose-tolerance tests were performed by determining the fasting blood-sugar level, giving the patient 50 g. of glucose, and taking samples of venous blood half-hourly for two hours; the blood-sugar was estimated by the method of Folin and Wu (Folin 1929).

### Case-reports

**Case 1.**—(H.1190). Hypothyroidism was diagnosed in 1932 at the age of 6. In 1950 the patient was receiving thyroid gr. 5 daily, and diabetes mellitus developed. On admission for stabilisation her B.M.R. was −3% and her glucose-tolerance curve 238, 278, 302, 412, 298 mg. per 100 ml. She then left off taking thyroid, and after two months she was severely hypothyroid, her B.M.R. was −24%, and her glucose-tolerance curve 241, 406, 444, 414, 358 mg. per

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100 ml. She was stabilised on diet, soluble insulin 60 units, and thyroid gr. 3 daily. Her glucose-tolerance curve on discharge was 150, 231, 286, 328, 314 mg. per 100 ml.

**Case 2.**—(A.59280). Hypothyroidism was diagnosed in 1930 at the age of 43. In 1940, while she was euthyroid on thyroid gr. 1 daily, diabetes mellitus developed, which was stabilised on zinc-protamine insulin 24 units daily. She stopped taking thyroid, and in 1946 she was moderately hypothyroid and her B.M.R. was −27%. She was restabilised on thyroid gr. 2 and zinc-protamine insulin 30 units daily.

**Case 3.**—(B.96868). Hypothyroidism was diagnosed in 1936 at the age of 30. She took, for a short time, thyroid gr. 3 daily. Diabetes mellitus developed in 1949. On admission for stabilisation she was moderately hypothyroid, her B.M.R. was −27%, and her glucose-tolerance curve 101, 170, 185, 186, 199 mg. per 100 ml. She was stabilised on thyroid gr. 3 daily and a 1500-calorie diet without insulin.

**Case 4.**—(B.81222). Diabetes mellitus was diagnosed in 1939 at the age of 42. She was treated with soluble insulin 32 units daily, but her diabetes was never properly controlled. In 1949 she developed typical clinical hypothyroidism: her B.M.R. was only −9%, and probably her uncontrolled diabetes, which was not accompanied by wasting, had raised the B.M.R. above the usual hypothyroid level (DuBois 1936). Her glucose-tolerance curve was 325, 340, 406, 426, 480 mg. per 100 ml. She was stabilised on thyroid gr. ½, soluble insulin 36 units, and zinc-protamine insulin 40 units daily.

## Previously Reported Cases

The published cases of coincident true idiopathic primary hypothyroidism and "pancreatic" diabetes mellitus are listed in the accompanying table. Many cases cited in reviews—e.g., those of Campbell (1894), Gordon (1904), Lindblom (1916), and Escamilla et al. (1935)—have been excluded because one or other of the diagnoses is open to doubt.

CASES OF IDIOPATHIC HYPOTHYROIDISM WITH DIABETES MELLITUS

| Reference | No. of cases | Comments |
|---|---|---|
| Ewald (1895) | 1 | |
| Strasser (1905) | 1 | |
| Rohdenburg (1922) | 1 | |
| Brown (1924) | 1 | |
| Wilder (1926) | 1 | |
| Wright (1926) | 2 | In both cases the diagnosis of hypothyroidism was not absolutely established |
| Rowe (1926) | 1 | |
| Jamieson (1927) | 1 | |
| Joslin and Lahey (1928) | 1 | |
| Carey (1930) | 1 | |
| Weinstein (1932) | 2 | |
| Daniels (1932) | 1 | |
| Marañón (1932) | 1 | |
| Andersen (1933a) | 1 | |
| Castex et al. (1933) | 1 | |
| Shepardson and Wever (1934) | 1 | Includes a valuable review |
| Greenwald and Collens (1935) | 1 | |
| Durkin (1936) | 1 | |
| Boulin et al. (1937) | 1 | |
| Bader (1940) | 1 | |
| Daugherty (1941) | 1 | Existence of other doubtful cases mentioned |
| McCullagh (1942) | 1 | Existence of 4 other cases mentioned |
| Bastenie (1944) | 1 | Existence of 3 other cases mentioned |
| Joslin et al. (1946) | 7 | |
| Fongi et al. (1947) | 1 | |
| Mauriac (1947) | 1 | Complicated by cirrhosis of the liver |
| Altschul (1948) | 1 | Diagnosis of hypothyroidism not absolutely established |
| Bernstein (1948) | 1 | Complicated by Addison's disease |
| Means (1948) | 1 | Existence of other cases mentioned |
| Langeron et al. (1950) | 1 | This case has been described again by Langeron et al. (1951) |
| Bruni (1950) | 1 | |
| Iversen (1950) | 3 | Cites a case of Andersen (1933b), which may be the same as Andersen (1933a) |
| Lafuente (1952) | 2 | Both cases possibly associated with pituitary adenoma |
| Maggi and Margulis (1954) | 1 | |

## Discussion

It has long been recognised (Osler 1899, Parisot 1910, Garrod 1912) that glycosuria may be found in myxœdema in the absence of diabetes mellitus. This glycosuria recedes on treatment with thyroid, whereas usually the glycosuria of the diabetic myxœdematous patient increases on treatment with thyroid.

Garrod (1912) claimed that the onset of diabetes improved a myxœdematous patient, and the onset of myxœdema improved a diabetic patient. The first claim is doubtful and difficult to confirm; but the evidence strongly supports the second claim. The thyroid hormone is, in some respects, an insulin antagonist, and a glucose-tolerance curve showing impairment of tolerance is often found in thyrotoxicosis, whereas a "flat" (increased tolerance) curve is sometimes seen in myxœdema. If a patient has thyrotoxicosis and diabetes, thyroidectomy relieves the diabetes mellitus to the same extent as the patient becomes hypothyroid: as the hypothyroidism is controlled by treatment with thyroid, the diabetes relapses (Balfour and Sprague 1949). Before the discovery of insulin, thyroidectomy to produce myxœdema was advocated and performed for the treatment of diabetes mellitus that did not respond to diet (O'Day 1917). To produce a satisfactory remission of the diabetes the patient had to be made so very myxœdematous that this treatment did not enjoy great favour.

It is uncertain whether diabetes mellitus and hypothyroidism occur together less frequently than, as frequently as, or more frequently than the separate frequencies of the two diseases warrant. In two standard texts Duncan (1947) and Spence (1953) state that the combination is rare, whereas Means (1948) says that the two disorders are occasionally found together. Lawrence (1955) states that he has seen 50 such patients.

In the period under review there were 59,000 inpatients in the hospital; 574 of these were diabetic. Therefore 1% of the hospital inpatients were diabetic, and the expectancy is therefore that 1% of hypothyroid patients would be diabetic. In fact, 4 of 91 idiopathic hypothyroid patients (2 of 39 inpatients and 2 of 52 outpatients)—i.e., 5%—are diabetic. It was also found that 0·07% of the hospital inpatients were hypothyroid; therefore there is an expectancy that 0·07% of diabetics would be hypothyroid. In fact 2 of 574 diabetic inpatients—i.e., 0·3%—were hypothyroid.

Weinstein (1932) gives similar figures. In his series 1243 of 37,000 patients admitted were diabetic, 22 had myxœdema, and 2 had both diseases—i.e., instead of the expected 3%, 10% of myxœdemas were diabetic; and, instead of the expected 0·06%, 0·2% of diabetics were myxœdematous.

These figures lend support to the view that diabetes mellitus and idiopathic hypothyroidism are no less likely, and probably more likely, to be found together in the same patient than the separate frequencies of the two diseases warrant. However, the number of patients is too small for a statistically significant conclusion to be drawn. If this were the case, the question would arise whether one of the diseases predisposes to the other; whether there might be a common cause, a common degeneration or hypofunction of two different endocrine glands; or whether one disease is diagnosed more easily in the presence of the other. There is no evidence for the first contention. It is just possible that a common degenerative process might affect the thyroid and the pancreatic islets, but in view of the different age-incidences and types of patient who are affected this is unlikely. The third explanation is probably correct: patients who have been diagnosed as having either hypothyroidism or diabetes mellitus are under continuous observation

by a physician; and any complicating illness will be observed and diagnosed early.

### Summary

Published cases of coincident diabetes mellitus and hypothyroidism are surveyed, and 4 additional cases described.

Hypothyroidism improves the carbohydrate tolerance of a patient with diabetes mellitus.

The two diseases occur together no less frequently than their independent frequencies warrant.

I wish to thank Miss B. Whittle, S.R.N., for her assistance with the initial sorting of the records. Mr. W. F. F. Kemsley, of the Social Survey, and Dr. Ian Sutherland, of the M.R.C. Statistical Research Unit, have taken much time and trouble over advising me on the statistical aspects; I am grateful also to Mr. T. E. Cowan, statistician, Middlesex Hospital, for his help with hospital records; to Dr. Deborah Doniach, Dr. John Friend, and Dr. H. L. Marriott for helpful conversations; and to the consultant staff of the Middlesex Hospital and associated hospitals for further information about their patients and for permission to quote from their case-notes. My thanks are due to Sir Charles Dodds for his advice and interest at all stages of this work.

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# HYDROCORTISONE IN PAINFUL SHOULDER

## A CONTROLLED TRIAL

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PAIN arising in the shoulder-joint is difficult to diagnose and to treat. The diagnosis is not rendered any easier or more accurate by the lack of general agreement about the cause (Moseley 1953). Treatment has usually been unsatisfactory, and has tried the patience of patient and surgeon alike. As a rule the pain seems to subside of itself within about two years leaving various degrees of limitation of movement.

Successful treatment with intra-articular or peri-articular hydrocortisone has been reported by Hollander (1953), Crisp and Kendall (1955), and Quin (1955). But, apart from a reference by Crisp and Kendall to previous control experiments with procaine, we have not noted anything approximating to a controlled trial, and many of the cases reported have been treated by the injection of hydrocortisone with the addition of a local anæsthetic. This point did not escape the notice of correspondents after the publication of at least one paper.

The condition was reviewed by Furlong (1952) and was the subject of an annotation in this journal (*Lancet* 1953).

### Present Investigation

We report here the results of treating 24 painful shoulders with hydrocortisone and compare them with the results of treating 27 painful shoulders with lignocaine ('Xylocaine') injections. We included in the trial only those patients who had a functional disability resulting from what we believed would generally be accepted as a periarthritis. We selected from among the recent records and from referred cases patients who complained of shoulder pain with or without a history of trauma. We excluded from the trial all cases in which we believed that the supraspinatus tendon had been completely ruptured, all cases of painless stiff shoulder, and all cases with old or recent injury of bone. The cases selected proved singularly free from limitation of flexion and extension sufficient to cause functional embarrassment.

#### *Assessment of Patients*

Sex, age, side affected, and duration of symptoms were recorded.

*Trauma* was recorded as 0, absent; 1, indefinite; 2, mild; or 3, severe. A direct blow was generally recorded as mild, and a fall on the shoulder as severe.

*Pain* is notoriously difficult to assess. The clinical assessments and measurements were made throughout the trial by one of us (G. F. M.), and included in the assessment was a clinical impression of the patient's threshold of pain. It was supported by a graded record of (1) the patient's estimate of stiffness, (2) interference with sleep, (3) frequency, dose, and type of analgesics taken, and (4) interference with the patient's usual occupation. Pain was recorded as 0, absent; 1, mild; 2, moderate; 3, severe; or 4, acute.

*Occupation* was recorded.

*Examination of shoulder.*—Active movements were assessed. Abduction and rotation were measured with a modified pelvimeter whose arms had been straightened and to which a suitable 'Perspex' protractor had been fitted. Abduction was measured as the angle recorded when the instrument was placed with its axis on the tip of the acromion, one limb running over the inferior angle of the scapula, while the other lay over the olecranon. In

TABLE I—AGE-DISTRIBUTION OF THE CASES TREATED BY INJECTION

| Age (yr.) | Over 75 | 66–75 | 56–65 | 46–55 | 30–45 | Under 30 |
|---|---|---|---|---|---|---|
| Lignocaine series .. | 2 | 3 | 7 | 12 | 3 | 0 |
| Hydrocortisone series | 0 | 4 | 8 | 10 | 2 | 0 |

this way we tried to measure glenohumeral abduction. External rotation was measured with the elbow flexed and in contact with the chest wall. The angle measured was that subtended by the arc described by the radial styloid as the forearm moved from its internally rotated position across the front of the chest to the position of the greatest possible external rotation, the elbow remaining against the lateral chest wall. We believe that, measured in this way, an angle greater than 90° may be considered normal.

Measurements of flexion and extension with the same instrument suggested to us that little of the patient's disability could be attributed to flexion defects where this movement was possible to 90°, or to extension where this was possible to 50°.

*Method of Injection*

The needle was inserted under the tip of the acromion. The fluid was injected to infiltrate a fan-shaped area on

TABLE II—SUMMATION OF TOTAL PAIN UNITS AT INITIAL ASSESSMENT AND AVERAGE IMPROVEMENT IN CASES TREATED BY INJECTION

| — | Hydrocortisone | | | Lignocaine | | |
|---|---|---|---|---|---|---|
| | No. of cases | Total pain | Average | No. of cases | Total pain | Average |
| Initial .. .. | 24 | 59½ | 2·5 | 27 | 48·0 | 1·8 |
| 1 week .. .. | 22 | 21 | 1·0 | 24 | 15·5 | 0·65 |
| 4 weeks .. .. | 19 | 20 | 1·0 | 17 | 17·5 | 1·0 |
| 8–12 weeks .. | 11 | 18·5 | 1·7 | 9 | 12·5 | 1·4 |

the superior, anterosuperior, and posterosuperior aspects of the capsule and pericapsular tissues. Where tenderness was localised to one part of the area, this part was particularly sought after with the needle tip. In many cases patients noted pain similar to that of which they complained, and in some cases with a similar reference. In some cases the pain was intensified. We believed it important to insert the injection into the capsular and pericapsular tissues, which offer a considerable resistance to the injection, rather than into the subacromial space, where resistance is minimal. All the injections were given by one of us (D. M.). Patients received either (1) 5 ml. of a 2% lignocaine solution to which was added hyaluronidase 1000 Benger units or (2) 25 mg. of hydrocortisone acetate (Upjohn) in a suspension to which was

TABLE III—DEFICIENCY IN ABDUCTION AND AVERAGE IMPROVEMENT

| — | Hydrocortisone | | | Lignocaine | | |
|---|---|---|---|---|---|---|
| | No. of cases | Total abduction deficiency | Average | No. of cases | Total abduction deficiency | Average |
| Initial .. | 24 | 895° | 37° | 27 | 940° | 35° |
| 1 week .. | 22 | +330° | +15° | 24 | +135° | + 6° |
| 4 weeks .. | 19 | +180° | + 9·5° | 17 | +140° | + 8° |
| 8–12 weeks | 11* | +175° | +16° | 9† | +165° | +18° |

* These 11 cases had an initial assessment averaging 45° less than 135.

† These 9 cases had an initial assessment averaging 49° less than 135.

added sufficient sterile saline solution to make the total injection up to 5 ml. Hyaluronidase 1000 Benger units was added.

*Selection and Management of Cases*

94 painful shoulders were available for examination in 93 patients who had recently attended or were currently attending the department. They were examined and their disability was assessed. In some cases little disability was present at the time of examination; so these cases were discarded from the trial. Patients who had a definite

TABLE IV—DEFICIENCY IN EXTERNAL ROTATION AND AVERAGE IMPROVEMENT

| — | Hydrocortisone | | | Lignocaine | | |
|---|---|---|---|---|---|---|
| | No. of cases | Total deficiency of external rotation | Average | No. of cases | Total deficiency of external rotation | Average |
| Initial .. | 24 | 805° | 33·5° | 27 | 805° | 30° |
| 1 week .. | 22 | +170° | + 7·7° | 24 | +110° | +4·6° |
| 4 weeks .. | 19 | +225° | +11·8° | 17 | +150° | +9° |
| 8–12 weeks | 11 | + 95° | + 8·6° | 9 | + 65° | +7·2° |

functional disability were treated by the injection of one or other of the solutions described, the choice depending entirely on the day on which the patients were seen for assessment. This produced some interesting equalities between the series.

Active exercises were prescribed, and the patients were seen at intervals of a week for three or four weeks and thereafter less frequently. When they reported, the clinical assessment was made in the same way as in the initial consultation. Changes in clinical findings were recorded numerically. Severe pain (recorded as 3) which under treatment became mild (recorded as 1) was noted as a gain of +2. Changes in abduction and internal rotation were recorded as gains or losses of units. The unit adopted was of 15°. The maximum gain of 60° would be recorded as +4.

TABLE V—ANALYSIS OF AVERAGE IMPROVEMENTS IN PAIN AND ABDUCTION IN INJECTED CASES RELATIVE TO DURATION OF DISABILITY AT TIME OF INJECTION

| Duration of disability (weeks) | 1–5 | | 6–10 | | 10–20 | |
|---|---|---|---|---|---|---|
| — | Pain | Abduction | Pain | Abduction | Pain | Abduction |
| Hydrocortisone | +1·2 | +21° | +1 | +10·5° | +1 | +7·5° |
| Lignocaine .. | +0·75 | +19·5° | +1·4 | +19·5° | +0·4 | −6° |

Of the 27 patients receiving lignocaine 19 were male and 8 were female; in 20 cases the right shoulder was involved and in 7 the left. Of the 24 patients receiving hydrocortisone 18 were male and 6 female; in 14 cases the right shoulder was affected and in 10 the left. Table I shows the age-groups of the patients who received injections.

## Effects of Treatment

Table II is an attempt to show alterations in pain following injections. It shows a summation of pain units and of improvement during follow-up. Average pain assessments are also shown.

Table III shows a summation of the total deficiency of abduction at the initial assessment and the average deficiency. It compares the total and average improvement in the two series of cases.

Table IV shows a summation of the total deficiency in external rotation, together with the improvement in the same way as table III.

Table v shows an analysis of the average improvements in the injected cases relative to the duration of the disability at the time of injection.

Only one adverse reaction to injection was seen, but this was most alarming for some minutes.

It occurred in a man of 48 who had a painful shoulder with no history of trauma. During the injection of the hydrocortisone-hyaluronidase solution, after most of the injection had been given, he complained of retrosternal discomfort and became dyspnœic. He developed a non-productive cough. He felt faint. He collapsed from the chair in which he was seated. The skin over the upper half of his body became first flushed and then cyanosed. There was apparently considerable bronchospasm. The neck veins were distended. The skin was clammy. The pulse deteriorated strikingly in volume and remained just palpable at a rate of 120 per minute. He recovered slowly in five minutes and returned within an hour to his occupation of plucking poultry for the Christmas festivities.

Although aspiration tests had been negative, we felt that it was likely that in this case some of the solution had been injected into a vein.

### Discussion

Clinical impressions depend on the highlights. We had dramatic improvement in one or two cases in either series. Equally we had cases which received not the slightest benefit. It was of interest that the patient's estimate of his improvement was often not borne out on measurement. Improvement in pain was not necessarily followed by an increased range of movement. We were in no doubt but that injection was worth-while, but it was not apparent that the results of one injection were better than those of the other.

Reviewing the evidence presented in tabular form we would draw attention to the maximum age-incidence at 46–65 years (table I). The incidence in the various age-groups is similar in the two series. We doubt whether the differences in relief of pain shown in table II are significant in view of the initial lesser pain in the lignocaine-treated series. We are more doubtful whether the accuracy possible in estimating pain allows us to place mathematical significance on small differences.

In table III the average deficiency in abduction in the two series is similar and allows of a more direct comparison. At the end of a week the trial favoured the use of hydrocortisone. We do not believe that the later results show any significant difference. Table IV shows results which are parallel with those in table III. Improvement in rotation after a week was greater in the cases treated with hydrocortisone. The later results were less conclusive.

In table V the results are seen to be better in both series in the early cases. Lignocaine was less efficaceous than hydrocortisone where the condition had lasted longer than ten weeks. This finding is counterbalanced by the better results with lignocaine where the condition had lasted from six to ten weeks.

Reviewing this evidence we were confirmed in our clinical impression that injection as practised into the periarticular structures was of benefit symptomatically and mechanically. Hydrocortisone was not shown to be greatly superior to lignocaine. We doubt whether it has any specific action in painful shoulder.

Two further points became apparent during our inquiry: (1) we found no relation between these cases and any of the rheumatic or rheumatoid syndromes, coronary disease, cervical spondylosis, or Dupuytren's contracture; and (2) the history of trauma did not appear to influence the natural history of painful shoulder or its reaction to injection.

### Summary

A comparative trial of the effects of the local injection of hydrocortisone and of lignocaine in the treatment of painful shoulder did not show any great advantage in either substance over the other. Both produced benefit.

It seems doubtful whether hydrocortisone has any specific effect in this condition.

One severe reaction to hydrocortisone-hyaluronidase injection is recorded.

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## BRONCHIAL LAVAGE FOR THE RECOVERY OF THE TUBERCLE BACILLUS

### COMPARISON WITH GASTRIC LAVAGE AND LARYNGEAL SWABBING

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ATTEMPTED recovery of the tubercle bacillus is part of the routine investigation of a pulmonary lesion; and, if the patient has no sputum, either gastric lavage or laryngeal swabbing is commonly used. Bronchial lavage is another method; and at Ruchill Hospital it has seemed so successful that we decided to compare its efficacy with that of the standard procedures.

Laryngeal swabbing, gastric lavage, and bronchial lavage were all carried out in each of 144 patients in whom minimal, possibly active, pulmonary tuberculosis had been diagnosed as the result of routine radiography. It was thought that this type of case would provide a good test of the efficiency of the different methods, because experience has shown that it is here often difficult to recover tubercle bacilli, even when the tuberculosis is active.

### Investigation

*Technique of Bronchial Lavage*

The technique was essentially the same as for the over-the-tongue method for bronchography. The patient sat in a chair; his tongue was held forward; he was instructed to keep breathing and to avoid swallowing; and 3 or 4 ml. of 1% amethocaine hydrochloride ('Anethaine') with 1/10,000 adrenaline was run over the back of the tongue, 1 ml. at a time, into the larynx from a 2-ml. syringe. After a few minutes the patient was tilted to the affected side, and 10–15 ml. of sterile physiological saline solution was similarly run over the back of the tongue into the larynx from a 20-ml. syringe to which a short piece of rubber tubing was fitted. The saline solution was coughed up from the bronchial tree, and the expectorated material was collected in a sterile basin, transferred to a sterile container, and sent to the laboratory for culture. The operator wore a gown and mask as in taking a laryngeal swab.

*Plan of Experiment*

When a presumptive diagnosis of minimal, possibly active, pulmonary tuberculosis was made as the result of routine radiography at the Glasgow Mass Miniature Radiography Centre, the patient was admitted to Ruchill Hospital on an evening, and a laryngeal swab was then taken. Next morning another laryngeal swab

was taken, after which gastric lavage was carried out, and finally bronchial lavage. The patient was then discharged from hospital so that his work should be interrupted as little as possible. Laryngeal swabbing and bronchial lavage were carried out by medical staff familiar with the methods, and in almost all cases were done by two physicians; gastric lavage was undertaken by nurses to whom it was a routine procedure.

*Cultural Methods*

The material obtained by bronchial lavage consisted of about 10 ml. of cloudy fluid containing small portions of mucoid material. The whole of this specimen was concentrated by the method of Petroff. About 3 ml. of 40% sodium hydroxide was added, and the mixture was allowed to stand for fifteen minutes at 37°C before being centrifuged at 3000 r.p.m. for a further fifteen minutes. The supernatant fluid was then decanted and the sediment emulsified and neutralised with N/1 hydrochloric acid. The resulting concentrate was inoculated on to slopes of Löwenstein-Jensen's medium. If it was positive, a growth was usually obtained in about three weeks, but all the cultures were maintained for about eight weeks.

Gastric-lavage specimens were treated exactly as described above. Every effort was made to treat all the specimens in this investigation immediately they were received in the laboratory, and in no instance were specimens of gastric juice allowed to stand more than thirty minutes before being treated.

Laryngeal swabs were immersed in 5% oxalic acid at 37°C for twenty minutes. The excess of fluid was then squeezed out, and the swab was inoculated directly on to Löwenstein-Jensen's medium.

## Results

Tubercle bacilli were cultured from material obtained by bronchial lavage, gastric secretions, and two laryngeal swabs in each case. In 35 of the 144 cases diagnosed radiologically as minimal pulmonary tuberculosis a positive result was obtained by one or more of the methods used. Bronchial lavage gave a positive result in 26 patients; gastric lavage in 14; and one or other or both laryngeal swabs gave a positive result in 8. Bronchial lavage was positive in 18 cases when the other methods failed; gastric lavage in 6 cases when the other methods failed; and a laryngeal swab was positive in 1 case when the other methods failed. The results may be summarised thus:

| No. of cases | Method | No. positive |
|---|---|---|
| 144 | Any or all | 35 (24%) |
| 144 | Bronchial lavage | 26 (18%) |
| 144 | Gastric lavage | 14 (10%) |
| 144 | 2 laryngeal swabs | 8 (6%) |

## Discussion

de Abreu (1944) recommended "pulmonary lavage" for the recovery of tubercle bacilli, and this method, with various technical modifications, has since been described as tracheal lavage, tracheobronchial lavage, and bronchial lavage.

Staines (1948), Bueno (1949), and Wardrip et al. (1949) found, as in the present series, that bronchial lavage gave a higher yield of positive cultures than did gastric lavage, and Deakins and Barber (1953), after an extensive trial, reported that the methods gave equally good results. It may therefore safely be concluded that bronchial lavage is at least as efficient as gastric lavage and probably more efficient.

At the same time, it must be remembered that such trials show only the relative efficiency of the methods in practised hands, and do not indicate what their relative efficiency would be if they were used generally. Probably in general use gastric lavage would prove the more reliable, because one can readily tell whether or not the technique has been properly applied, whereas with bronchial lavage it is less easy for the inexperienced operator to be sure that he has succeeded in getting the saline solution into the bronchial tree.

The best results will, of course, be achieved when both bronchial lavage and gastric lavage are used, and this is advisable in cases in which it is important to recover tubercle bacilli, if present, within a limited time.

Bronchial lavage has the advantage over gastric lavage that it can be done in the outpatient department. But as in laryngeal swabbing, the operator runs a risk of infection, against which suitable precautions must be taken.

It might also be objected that the use of local anæsthesia is not without risk to the patient; but, with the small quantity and weak dilution used in the technique described above, the danger, if any, must be very small. A weak solution suffices because the administration of the material is valuable for training the patient to avoid swallowing, and the degree of anæsthesia appropriate for bronchography is obviously not required.

Laryngeal swabbing—despite its comparatively low efficiency judging by the results in the present series—is probably the best method for the routine examination of known tuberculous patients. It is easier to do, and it can be repeated many times without inconvenience to the patient.

## Summary

Bronchial lavage, gastric lavage, and laryngeal swabbing (morning and evening swab) were carried out at about the same time in each of 144 patients in whom a minimal, possibly active, tuberculous lesion had been diagnosed by routine radiography. Using all three methods tubercle bacilli were found in 35 (24%) cases; using bronchial lavage they were found in 26 (18%); using gastric lavage they were found in 14 (10%); and using two laryngeal swabs they were found in 8 (6%).

The technique of bronchial lavage is described.

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# CARCINOMA OF THE ISLETS OF LANGERHANS

## A TEST FOR HYPERINSULINISM

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HYPOGLYCÆMIA due to carcinoma of the islets of Langerhans is well known. The observations made since its original description by Wilder et al. (1927), have been well summarised by Lopez-Kruger and Dockerty (1947), Howard et al. (1950), and Skillern and Rynearson (1953). In the following case a new diagnostic method was used, and in conformity with previous reports, the results of medical treatment with cortisone and alloxan were poor.

## Case-report

A slightly obese woman, aged 78, was admitted to hospital with the diagnosis of cerebral thrombosis. Her relatives reported that she had chronic hypertension and that her comatose condition, which had appeared a few days previously, was very noticeable in the morning but tended to lighten in the afternoon, the patient becoming almost normal by the

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evening. This recurrence of morning coma and evening recovery was observed at the hospital.

Observations on blood-sugar levels supported the tentative diagnosis of hyperinsulinism; and, as its rapid development and the patient's advanced age suggested carcinoma of the islets of Langerhans, further tests were undertaken.

*Fasting Test.*—After the evening meal the blood-glucose level was 43 mg. per 100 ml. During the night the level fell progressively to 20 mg. per 100 ml. at 5 A.M. The patient then became comatose but was immediately aroused with intravenous glucose 18 g.

*Oral Glucose-tolerance Test.*—With a fasting blood-glucose level of 48 mg. per 100 ml., the levels 60 and 90 minutes after the intake of glucose 50 g. were respectively 100 and 44 mg. per 100 ml.

*Glucose-assimilation Coefficient.*—By the mathematical analysis of intravenous glucose-tolerance curves (0·33 g. per kg.) Conard et al. (1953) calculated the value of the glucose assimilation in normal and pathological conditions.† In normal subjects, the glucose-assimilation coefficient is 1·80 ± 0·16. In elderly people lower values are observed (0·99 ± 0·30). When insulin and glucose are given together, the speed of assimilation of glucose is increased, and the glucose-assimilation coefficient rises to 5·87 ± 1·70. Non-treated diabetics have a very low glucose-assimilation coefficient (0·50 ± 0·20). The present patient's glucose-assimilation coefficient was high (3·22). Under cortisone treatment it dropped rapidly to 1·70. After a week, as the treatment failed, the coefficient returned to its original value of 3·00, and by the 14th day of treatment had risen to 4·00 (fig. 1).

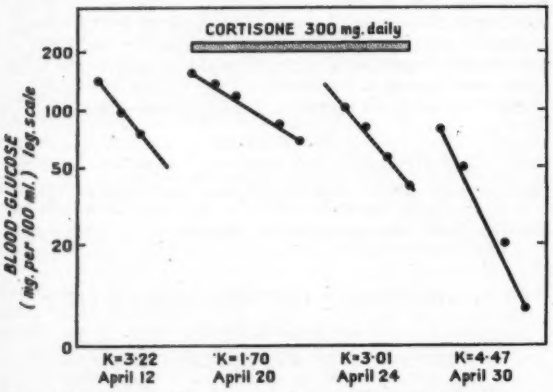


Fig. 1—Changes in glucose-assimilation coefficient in relation to cortisone therapy.

*Treatment.*—In spite of unfavourable reports in the literature, we treated the patient with cortisone and, later, alloxan. Soon after cortisone 300 mg. daily had been given, it was possible to reduce the huge glucose infusions without producing hypoglycæmia (fig. 2); but in a few days, despite continued cortisone treatment and increased glucose infusions, the blood-glucose level dropped again, and the patient relapsed into repeated morning coma. Rapid intravenous injections of alloxan were then given: 3 g. (50 mg. per kg. body-weight) on the first day and 6 g. (100 mg. per kg. body-weight) on the third and fourth days.

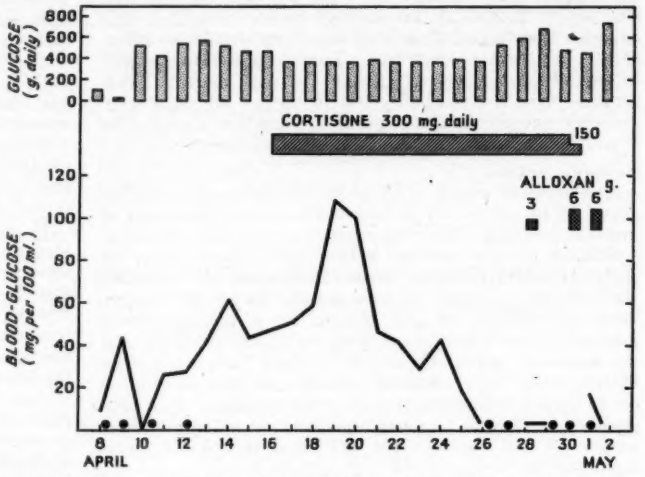


Fig. 2—Blood-glucose levels in relation to treatments: black dots, hypoglycæmic crises.

*Operation and Death.*—The patient's condition deteriorated further, and she was transferred to the surgical section, where a tumour of the pancreas was extirpated along with the caudal segment. She died shortly afterwards.

*Morbid Anatomy.*—Both the operation specimen and the metastases found at necropsy contained large cells in which only a scanty amount of β granules were detected by the Gömöri-Nerenberg technique. The adrenal cortex was thin and poor in spongiocytes. Crooke's cells were present in the pituitary gland.

## Discussion

*Diagnosis.*—The diagnostic criteria of hyperinsulinism, as pointed out by Whipple and Frantz (1935) and Wilder (1940), are: (1) a typical history of hypoglycæmia; (2) a fasting blood-sugar level below 50 mg. per 100 ml.; (3) suppression of symptoms by intravenous glucose; (4) previous good health; and (5) intolerance of fasting. The present investigation suggests that a sixth diagnostic test may be added—that of the glucose-assimilation coefficient. The accelerated assimilation of glucose in insulinoma is further confirmed by an unusually large difference in the arterial and venous blood-glucose levels (Boudin et al. 1950).

*Cortisone Therapy.*—Bastenie et al. (1954) have shown that, in people with normal glucose tolerance, the administration of cortisone brings about a very transient decrease in the assimilation of glucose, later followed by a definite increase. In the present case the raised glucose-assimilation coefficient before therapy was analogous to that found after experimental administration of insulin and glucose. It was first lowered by cortisone and later rose again in spite of the continued administration of cortisone. Apparently the primary phase of reduced assimilation resulted from an insulin-inhibiting effect of cortisone, and perhaps from increased gluconeogenesis. In the second phase the secretion of insulin was compensatorily increased, speeding up the assimilation of glucose. The same phenomenon occurs in cortisone-induced diabetes in the rat (Franckson et al. 1953).

*Alloxan Therapy.*—In certain laboratory animals alloxan induces degranulation and necrosis of the β cells; but so far the published results of alloxan therapy in patients with β-cell tumours or hyperplasia have been far from encouraging. Two cases in young infants (Talbot et al. 1948, Griffith et al. 1951) improved temporarily when treated with alloxan 25–150 mg. per kg.

† After rapid injection of glucose into the veins the blood-glucose level at first rises sharply and then falls abruptly. This phenomenon is regulated by the diffusion of the injected glucose through the extracellular fluids. From the 10th to the 60th minute after the glucose injection, the blood-glucose level falls more slowly, following an exponential curve. The slope of this curve is easily calculated from the formula

$$K = \frac{\log C - \log C'}{t' - t}$$

K being the angular factor to the semi-exponential line, and thus indicating the speed of assimilation of glucose by the tissues. Therefore this factor can be considered as the "glucose-assimilation coefficient."

body-weight. A similar dose in the present case had no clinical effect. Histological observations on alloxan-treated hyperinsulinic tumours are very rare (Gordon and Olivetti 1947, Conn and Hinerman 1948, Böttger et al. 1952, dePeyster and Gilchrist 1954). There is general agreement that alloxan has no effect on the tumour tissue.

### Summary

A case of rapidly growing cancer of the islets of Langerhans in a woman aged 78 is reported.

A new and easy diagnostic test is proposed for the diagnosis of hyperinsulinism—namely, the measurement of the rate of disappearance of intravenous glucose.

Treatment with cortisone produced only temporary benefit, and subsequent treatment with alloxan had no clinical effect.

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## CERVICAL LUNG HERNIA

### REPORT OF A CASE

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HERNIATION of the lung is in itself rare; and in the following case it was unusual in both site and causation.

### Case-report

One morning in the autumn of 1947 Mrs. A, aged 51, who had had no illness since childhood, noticed a swelling in her neck. It had subsided by the evening, leaving nothing more than "stiffness in the neck"; and by the time she visited her doctor there was nothing, beyond her story, on which to base a diagnosis.

This sequence of events was repeated once in 1948 and several times in the early months of 1949. The patient was now noticing, too, that the swelling gave rise to an annoying cough, with much wheezing, and to a sensation of throbbing in the neck.

In June, 1949, she was able for the first time to show the swelling to her doctor, and later in that month she was sent to the chest clinic. Here the only abnormality found was a swelling in the right supraclavicular fossa: the size of half an orange, it was tense, resonant, and non-pulsatile, and on auscultation no added sounds were heard over it. When manual pressure was applied to the swelling—the patient meanwhile breathing deeply—it shrank in a minute or two to a third of its former size. Subsequent radiological examination, which included fluorography and barium swallow, showed no abnormality.

These findings strongly suggested hernia of lung, and the patient was admitted to hospital. But the condition was still recurring only intermittently and for a few hours at a time; and, though she stayed in hospital for several weeks, the surgeon got no chance to observe her hernia. Other investigations at this stage were unrevealing.

Where herniation recurred in September, 1949, it persisted for several days, and was accompanied by pain. More trying to the patient was a worsening of the sensation of throbbing in the head and neck, which suggested some interference with the return of blood from the head. These symptoms were regarded as severe enough to justify an attempt at surgical exploration and relief, and the patient was readmitted to hospital, where, in November, Mr. W. P. Cleland performed a right thoracotomy.

*Operation*

"No pleural adhesions. Upper lobe small, otherwise normal. The posterior part of the aperture of the thorax appeared intact and firm, but just in front of the innominate vein, in the angle between it and the internal mammary artery, the pleura was lax and redundant and could be elevated from the surface for about one inch with ease, and similarly it could be invaginated up into the neck for at least one inch and a half. The parietal pleura and extrapleural tissues were dissected up from this area to form a small pouch. Into this pouch a two-inch square of tantalum gauze was inserted and fixed by stitching to adjacent structures: this appeared to give quite a reasonable area of support."

*Further Progress*

Convalescence was uneventful and the tantalum gauze has remained in place. Last seen in January, 1955, the patient was very well. There has been no recurrence of the herniation, and she has not been troubled by any other symptoms of chest disease.

### Discussion

It is not surprising that lung herniation should be rare; for the negative pressure within the thorax ensures that, if the chest wall is injured, the elastic lung will collapse within the thorax rather than extrude itself without. Reviewing the literature in 1946, Maurer and Blades found fewer than 185 cases on record, to which they added several more. Since then reports have come from Pine and Morganstern (1948), Meakins et al. (1948), Mann et al. (1949), Van Wezel (1950), Bass (1950), Palazzo and Garrett (1951), Freitas and Vonfraenkel (1951), and Rheinhardt and Hermel (1951).

Lung hernias are usually classified by site and by ætiology, and most writers have followed the classical description of Morel-Lavallée (1845–47), whose review extended to cases recorded as long ago as the end of the 15th century. A more modern survey is that of Montgomery and Lutz (1925), who collected 165 cases from the literature and found that of the 78 in which the site of herniation was mentioned it was cervical in only 16. Of the few cases recorded since Maurer and Blades wrote in 1946, the majority have been of cervical herniations.

The condition may occur at any age. In some cases it is clearly attributable to developmental defects in the chest wall or to defects resulting from intra-uterine abnormalities or accidents. The case of Palazzo and Garrett (1951) was that of an infant whose cervical hernia was noticed at the age of 48 days: the child was born with a cleft lip and palate and with other anatomical abnormalities. In many cases, however, there is a convincing history of trauma—though, oddly enough, comparatively few cases have been recorded in times of war.

Goodman (1933) states that 3 cases of lung hernia were said to have resulted from the American Civil War and that only 5 cases were found among 20,000 instances of chest wounds seen during the Russo-Japanese war. Maurer and Blades state that no cases were seen during the 1914–18 war; but their own series comprised 7 cases resulting from the 1939–45 war.

Cleland (1955) has seen an unusual instance of traumatic herniation, occurring between the 5th and 6th ribs in the anterior axillary line, in a farmer attacked by a bull. Though the animal's horn did not penetrate the skin, the blow must have torn the intercostal muscles and the pleura, for a hernia of the size of a walnut appeared at the site of impact and eventually required operation. It was then discovered that the parietal pleura in the region of the hernia was abnormally thin.

In Pine and Morganstern's 4 cases the hernia appeared after thoracoplasty: these cases were unusual in that

the hernia produced severe pain—in one patient so intense as to lead to an attempt at suicide. So-called spontaneous herniation is attributed by most writers to a combination of factors—namely, local weakness of the chest wall, associated with abnormally high intrathoracic pressure brought on by such diverse causes as excessive cough, glass-blowing, and heavy lifting.

Van Wezel (1950) records an unusual case of bilateral cervical herniation in a man of 39 who had been suffering from a progressively severe winter cough; and postulates congenital deficiency in Sibson's fascia as the underlying factor.

Freitas and Vonfraenkel (1951) report a cervical hernia in a boy, aged 4, who had for some months been in the habit of inflating balloons and plastic toys.

In the present case no definite cause could be found. The patient had little or no cough before the hernia began to appear, and such cough as she had later she attributed to the swelling.

The diagnosis of lung hernia should not ordinarily present much difficulty, provided the possibility is kept in mind. The presence of a swelling, often painless, which appears only after trauma or after exertions which raise the intrathoracic pressure, is suggestive.

Decisions about treatment may be more difficult. Though earlier writers describe various conservative measures, such as bandaging, and point to the need for a change of occupation if this has contributed to herniation, the emphasis has now, of course, shifted to surgery. In 1946 Maurer and Blades felt that experience had not yet been sufficient to justify the establishment of any single remedial technique, but said that "any defect of the chest wall, regardless of size, can usually be repaired by plastic procedures involving only structures which are part of the chest wall, namely rib, periosteum and muscle." This dictum can hardly apply in cases where herniation is into the neck; and in these, it would seem, some form of prosthesis must be devised.

I wish to thank Dr. R. D. Rutherford, who referred this patient; and I am much indebted to Mr. W. P. Cleland both for his personal note on the operation and for the details of his unpublished case.

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# New Inventions

## A NEW DESIGN OF SYRINGE

THE hypodermic syringe has altered but little in design since it was first introduced about a hundred years ago.[1] The syringe described here differs in one essential feature: it brings into action the hollow internal space of the plunger—a part of the syringe which has not previously been utilised. This modification does not in any way interfere with the normal working of the syringe but greatly increases the number and type of operations that can be effected.

1. Mogey, G. A. *Brit. med. J.* 1953, ii, 1180.

There are two holes, on opposite sides, in the wall of the plunger—one near the bottom, and one near the top—and two grooves in the outer cylinder or barrel (fig. 1); the plunger can be rotated until the holes lie opposite the grooves, when the piston indicator-line lies between the barrel indicator-lines (fig. 1). The needle mount (C) has an incomplete circular groove and forms a rotating tap or stopcock when fitted on to the syringe nozzle, and the tap is closed when the needle mount comes up against the nozzle stop. (The needle indicator-fin lies in the same line as the barrel indicator-lines.) An opening is provided in the head (handle or button) of the piston (D) for filling or mechanically cleaning the interior of the piston. The opening is closed with a silicone rubber plug which will withstand sterilisation at 160°C.[2]

The syringe should always be manipulated with the nozzle pointing downwards and should never be filled above the "Full" mark. To set the syringe for ordinary use, both the indicator-fin and the piston are rotated out of alignment. In this position the tap is open, the holes and grooves are out of line, and the syringe is operated by the usual pull-in push-out method. To fill the syringe the piston is withdrawn, and the liquid travels into the outer cylinder just as it would do with any conventional syringe.

2. Nairn, R. C., Fraser, K. B. *Ibid*, 1954, ii, 171.

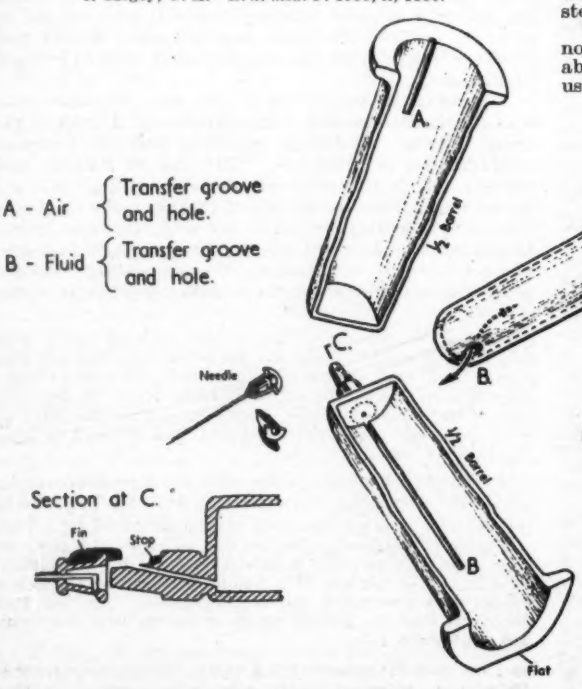
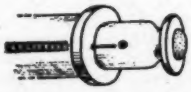



Fig. 1.



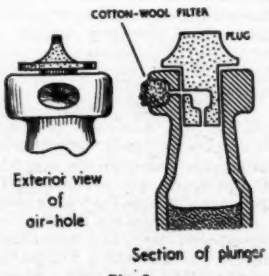




Fig. 2.

When the syringe is being used for its special purpose, the tap and piston are rotated into alignment, with the tap closed and the holes opposite the grooves. The piston is now pushed in, and this forces the fluid in the outer cylinder to travel through the lower groove and lower hole of the piston into the hollow piston. After the liquid has thus been transferred, the piston is rotated so that the grooves and holes are out of alignment. The piston is now air-locked in this position. It cannot slip out by accident, being firmly anchored by vacuum. When the injection is to be given, the action is reversed —i.e., the holes and grooves are once more brought into alignment, and withdrawal of the piston transfers the required amount of liquid back into the outer cylinder ready for injection.

If the operator is working blind under emergency conditions he can still operate the syringe because the piston and barrel are provided with flats (fig. 1) which can be aligned by touch. The needle, as already mentioned, is brought into alignment by rotating it against the stop.

The special advantages of the syringe are :

(1) There can be few users of a syringe who have not experienced humiliation and irritation during venepuncture on finding the syringe half-full of air and the required quantity of blood unobtainable despite the needle being in the vein. This impasse is easily overcome by turning the present syringe for a moment into alignment and pushing in the piston, so releasing the unwanted air. Another turn out of alignment, and venepuncture may be proceeded with.

(2) In general practice it is convenient to be able to pre-load the syringe before setting out to give domiciliary injections. Similar considerations apply to injections which have to be given under field conditions—e.g., in veterinary practice.

(3) As a temporary storage container the syringe may be found useful for the transport of insulin, adrenaline, or other self-administered drug.

(4) Viscous fluids, crystalline suspension, and seminal fluid may be put into the syringe through the opening in the button of the piston (fig. 1D).

(5) The syringe having two compartments, different medicaments may be contained in the barrel and in the hollow piston—e.g., thiopentone in the barrel and a relaxant in the piston. These medicaments may then be injected separately or they may be mixed in the syringe before use.

(6) The use of the piston compartment doubles the effective volume of the syringe.

Once a sterile container has been opened, its continuing sterility cannot be guaranteed. If medicaments are to be stored in this syringe for more than an hour or two they would have to be inhibitory to bacterial growth or else contain an added bacteriostatic. This is true of all liquid injections supplied in rubber-capped bottles. The head of the plunger can be so modified (fig. 2) as to ensure that sterile air alone comes into contact with the medicament.

The syringe is manufactured by Messrs. S. & R. J. Everett & Co. under licence (British Provisional Patent nos. 19546/53, 1519/54). The only model available at present is fitted with a standard stopcock.

Research Department,
Charing Cross Hospital,
London

B. CAMBER
M.B. Glasg.

# Medical Societies

## ASSOCIATION OF CLINICAL PATHOLOGISTS

THE 55th general meeting of this association was held in London on Sept. 29–Oct. 1. The following are summaries of a few of the many papers read at the meeting.

### Blood Changes in Toxic Reactions

Dr. W. M. DAVIDSON, discussing blood changes in toxic reactions, said that they ranged from eosinophilia, mild anæmia, or leucopenia, through the more serious acute hæmolytic anæmia, thrombocytopenic purpura, and agranulocytic angina to the dreaded marrow destruction of aplastic anæmia. Lack of accurate knowledge about the size of the risk of these reactions, of a laboratory test by which they may be anticipated, and of a real assessment of the importance of the prodromal signs, had created a situation in which valuable drugs might be avoided unnecessarily.

Some drugs, such as amidopyrine, 'Sedormid,' and phenacetin acted directly upon and destroyed the circulating cells or platelets. The method of destruction of the cells was often akin to the ordinary immune reaction in the presence of complement and it seemed that the drug formed a complex with the cell protein, which, being both antigenic and foreign to the individual, excited an antibody-antigen reaction. In other cases an abnormal pathway might lead to the formation of abnormal, potentially toxic metabolites. Other drugs seemed to act indirectly through the precursor cells in the marrow. An abnormally high concentration of the drug or its metabolites may be present in the marrow and figures suggesting a 20-fold concentration, as compared with the serum, had been reported. In some cases a type of Arthus phenomenon may develop in and destroy the marrow.

Blind serial blood-cell counts were futile in detecting the onset of a drug reaction, for the peripheral count might be normal on the eve of the fatal aplastic anæmia. Even relying upon the "first signs" of toxicity was hopelessly inadequate, for their appearance was probably either too late or a false alarm. Recent work with the antimalarial primaquine had suggested the possibility of detecting, in vitro, red cells which would be sensitive.

### Urinary 17-Ketogenic Steroids

Dr. ARTHUR JORDAN recalled that Norymberski, introducing the determination of the 17-ketogenic steroids into clinical medicine as an index of adrenal cortical activity, showed that oxidation would convert some of the metabolites of corticoids into 17-ketosteroids. 80% of people over the age of 16 had outputs of 17-ketogenic steroids ranging from 5·7 to 17·7 mg. per day. The output increased with administration of cortisone or corticotrophin. The output tended to be low in Addison's disease and Simmonds's disease and high in Cushing's syndrome, virilism, and in precocious puberty of adrenal cortical origin. Observation of the output following corticotrophin administration appeared to indicate whether the adrenal cortex could respond and was a useful diagnostic procedure in suspected Addison's disease.

### Hypophysectomy

Dr. D. N. BARON described the use of hypophysectomy, and of radiation destruction of the hypophysis, in the treatment of malignant disease, and the experience gained by the study of patients operated on by Mr. E. J. Radley-Smith at the Royal Free Hospital. Of 13 female patients with carcinoma of the breast operated on within the past year, in 5 the result had been good, with complete relief of pain and variable regression of the metastases. The rationale of the operation was the removal of somatotrophin and luteotrophin, as well as of corticotrophin and gonadotrophins; for certain tumours of breast and prostate were dependent on hormones for their continued spread. It was too early to say whether hypophysectomy would replace adrenalectomy plus oophorectomy in the treatment of breast cancer.

### Acid and Alkaline Phosphatase in Prostatic Cancer

Dr. STANLEY WRAY discussed an investigation in which the significance of the blood acid-phosphatase value was assessed in 500 miscellaneous cases, 407 of which were prostatic disease. It was shown that the formaldehyde-stable fraction was a better indication of the presence of cancer of the prostate than the more usual investigation of the total value. Urinary retention by itself could cause a moderate increase in the acid-phosphatase and it must be relieved before reliable results could be obtained. The blood alkaline-phosphatase had been estimated and graphically recorded in cancer of the prostate with bone secondaries during stilbœstrol therapy, and a definite pattern of response was obtained. This response pattern or alkaline-phosphatase "kick" may be used in cases of prostatic cancer to (1) confirm diagnosis, (2) aid in doubtful cases, (3) help assess the presence of osseous spread, (4) help in choice of therapeutic agent, and (5) act as "end-point" when assessing the value of treatment in other forms of cancer which give rise to bone secondaries.

### Complications and Failures of Antibiotic Treatment

Dr. K. B. ROGERS said that some of the failures and complications of antibiotic therapy could be anticipated, but often the trouble was an unpredictable reaction by an individual patient or a particular condition that prevented an antibiotic acting. The most common complications of

antibiotic therapy were due to cross-infection by insensitive organisms, such as staphylococci, and to moniliasis of the lungs or intestines. If there was fibrosis and loculation, as in pericarditis, empyema, or brain abscess, a theoretically effective antibiotic may not penetrate to the infecting organisms. It may be difficult to prove that a pyrexia during prolonged penicillin or streptomycin therapy was entirely due to the antibiotic, and it required a very fine clinical judgment to stop treatment. Allergic manifestations to penicillin and streptomycin were relatively common—cutaneous hypersensitivity in those who handled the drugs constantly, local irritation at the site of inoculation, and (relatively rarely) anaphylactoid reactions to penicillin. Dr. Rogers described 4 cases of anuria which were probably due to penicillin. The anuria lasted from 4 to 8 days and the patients involved were children between the ages of 8 months and 5 years. All recovered after treatment with Bull's régime, although 1 had a permanent disability after a further complication of monilial cystitis. Uncontrolled prophylactic umbrella therapy has produced staphylococci resistant to a wide range of antibiotics and these have caused serious complications in surgical units such as chest centres.

### Blood-acetoacetate Levels after Operation

Dr. L. NAFTALIN said that other workers had shown that in the first postoperative days endogenous fat was burned at the rate of about 2250 cals. per day—i.e., many times the rate observed in semi-starvation. On the assumption that increased acetoacetate is formed only when 2C fragments are being produced in excess of immediate tissue needs, serial examinations were made of blood-acetoacetate[1] in the hope of timing the switch-over to fat utilisation. In evaluating the results, starvation ketosis and certain other variables had to be considered; nevertheless, a sharp rise in blood-acetoacetate level appeared regularly soon after operative trauma, and sometimes after intravenous thiopentone only. The immediate rise was probably an adrenaline effect: the first high peak at 4–5 hours postoperatively might also be due to adrenaline, since corticotrophin and cortisone had been shown to depress blood-acetoacetate levels.[2] The curve of blood-acetoacetate against time might thereafter show a dip before rising to a further peak in excess, sometimes far in excess, of the level produced by simple starvation at comparable time. The effect of postoperative infusion of blood or glucose at or immediately after operation was also studied: the results suggested that after the immediate calorie value of the material infused had been made use of, the postoperative pattern of high blood-acetoacetate returned. In 3 well-defined cases of postoperative ileus no rise in blood-acetoacetate was found. Temporary ion poisoning of the aceto-CoA-inase enzyme system might be responsible.

### Pathology of Fatal Aircraft Accidents

Wing-Commander J. K. MASON pointed out that until recent years the limitations on air-frame and engine structure had confined the human factors in aviation to the sphere of the physiologists. But the jet engine had so increased the hazards of flight that aviation pathology had emerged as a subject distinct from aviation physiology and general traumatic pathology. The recently formed Royal Air Force section of aviation pathology regarded its main objectives as: (*a*) the correlation of post-mortem findings with engineering and other evidence in fatal accidents, thus helping to elucidate obscure causes of accidents; (*b*) the discovery of any recurring injuries which may suggest faults in aircraft design; (*c*) the assessment of new and experimental types of safety equipment in the light of previous post-mortem findings; (*d*) the search for pre-existing disease in aircrews which might be missed on ordinary methods of medical examination and yet might have a bearing on aircraft accidents; (*e*) the attempt to clarify some of the confusion which surrounded traumatic pathology in general and aviation pathology in particular, and which is mainly due, it was believed, to the fact that no single team of observers had had an opportunity to make a large number of necropsies on persons killed in aircraft accidents. Such uncertain aspects of aviation pathology included anoxia, injuries induced by pure accelerative and decelerative forces, the ætiology and prognosis of fat embolism, and, most important, explosive decompression. The section was anxious to secure the coöperation of coroners and coroners' pathologists.

1. Walker, P. G. *Biochem. J.* 1954, **58**, 699.
2. Kinsell, L. W., Margen, S., Michaels, G. D., McCallie, D. P. *J. clin. Invest.* 1951, **30**, 1486.

## Reviews of Books

### The House Physician's Handbook

C. ALLAN BIRCH, F.R.C.P., physician, Chase Farm Hospital, Enfield. Edinburgh: E. & S. Livingstone. 1955. Pp. 160. 10*s.* 6*d.*

THIS little book contains much information and practical advice that will be useful to the young resident. Though the chapter on clinical pathology covers ground which is also covered in many larger works, the section on general duties and information has a wide range of helpful hints and advice which are not so easily found. In places perhaps rather more detail would be welcome—e.g., on the subject of filling in the cause of death on a death certificate. Again in the chapters on clinical procedures those two problems of the house-physician—hysteria and malingering—might have been more fully described. Of the newer drugs cortisone is not mentioned, and the account of antibiotics gives little indication of the respective action of the different preparations or their drawbacks. But in a book of this size some omissions are inevitable. Dr. Birch has compressed a remarkable amount into his 160 pages.

### Radio-diagnostic des occlusions intestinales aiguës

CLAUDE OLIVIER, agrégé de la Faculté de Médecine de Paris. Paris: Masson. 1955. Pp. 258. Fr. 3300

THIS excellent review is based on extensive experience.

The early chapters deal with technique and indications for radiography; the relation of the radiographic appearances to the pathological cause are well described and clearly illustrated. Succeeding chapters deal in detail with the various types of intestinal obstruction and with other conditions, such as renal colic and acute pancreatitis, which give rise to changes in the radiographic picture. The final chapter, on intestinal obstruction in the newborn, might with advantage be elaborated.

This book will be of value to those interested in the subject—clinicians and radiologists alike.

### Neuro-vascular Hila of Limb Muscles

JAMES COUPER BRASH, M.C., M.D., D.SC., F.R.C.S.E., professor emeritus of anatomy, University of Edinburgh. Edinburgh: E. & S. Livingstone. 1955. Pp. 100. 30*s.*

THE work embodied in this small atlas was started in 1941 at the suggestion of Sir James Learmonth, who foresaw its potential value not only to the vascular surgeon but also to those working in the peripheral-nerve injuries centres set up during the war. Professor Brash's aim was to determine the extent to which the principal blood-supply of the muscles is associated with the nerves—i.e., the constancy or otherwise of a definite "neuro-vascular hilum." To achieve this, observations already recorded on the points and mode of entry of the nerves of supply had to be checked and extended.

In this long and exacting task the departments of anatomy at Aberdeen, Leeds, and Glasgow collaborated with him. The data for the upper limb were circulated to the peripheral-nerve injuries centres and others in 1945, but it is only now that it has been possible to collate and analyse the complete data for the lower limb also. This atlas is the result. In brilliantly clear diagrams, drawn exactly to a defined scale, it shows the nerve and vascular supply of all the principal muscles of the limbs with appropriate notes on the variations found by Professor Brash and earlier investigators. It is of course a highly specialised work but will prove invaluable to all surgeons interested in peripheral-nerve injuries or ischæmia of muscles—quite apart from its merit as a contribution to pure anatomy.

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**The Physiological Basis of Medical Practice** (6th ed. London: Bailliere, Tindall, & Cox. 1955. Pp. 1355. 91*s.* 6*d.*). —Prof. C. H. Best, F.R.S., and Prof. N. B. Taylor have subjected their notable work to "the most extensive revision since it was first published," so that hardly a page of it has escaped emendation, deletion, or addition. A good book kept well up to date can defy the ageing process which afflicts the rest of us. "Best and Taylor" has this secret of perpetual youth.

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*See* Brit. Med. Journ. 1953 (July 25), 2.214

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THE LANCET

*LONDON: SATURDAY, OCT. 15, 1955*

## Public Knowledge of Mental Hospitals

THERE are 210 mental and 196 mental-deficiency hospitals in Great Britain and Northern Ireland—not a great number, though they contain nearly half our hospital beds. It should not be impossible to present each year an accurate and comprehensive account of the standards of care, the state of the buildings, the equipment, and the staffing of these hospitals; but no such account is available. Every year fragments of information about them are published in various official documents, such as the annual reports of the Ministry of Health and the Board of Control, the Registrar-General's Statistical Review, and the Hospital Costing Returns; but these fragments are scattered through many tables, and not at all easy to assemble and collate. Moreover, much of the information is so general as to be almost meaningless. Thus the Board of Control, in their current annual report,[1] give us, as they do every year, a figure for overcrowding. In 1954, they tell us, the mental hospitals were overcrowded to the extent of 18,932 patients: but they do not say in which hospitals—or even in which regions—overcrowding is worst; and they do not explain what such figures mean in terms of distance between beds, the use of corridors or other unsuitable places as dormitories, or pressure on sanitary accommodation.

Some bold spirit once used to FLORENCE NIGHTINGALE the phrase "... without inconvenient overcrowding." "What," she replied, "is convenient overcrowding?" In mental hospitals overcrowding is no mere inconvenience but an actively nocent agent. Its effects could possibly be alleviated by much individual care and attention; but how can this be given when all mental hospitals are short of nurses, and many lack even a reasonable complement of such auxiliary grades as nursing assistants and orderlies? No official report tells us in which hospitals or regions the shortage is worst, or where nurses and other helpers are sufficiently numerous to ease the ills of overcrowding.

Again, the Hospital Costing Returns for 1954 show that the average weekly cost of provisions per person fed in mental and mental-deficiency hospitals ranged from 9*s*. 10*d*. (Franklyn Mental Deficiency Hospital, Exeter) to 25*s*. 7*d*. (the Coppice Mental Hospital, Nottingham), the usual figure being about 14*s*.–16*s*.; whereas the average weekly cost in general hospitals ranged from 14*s*. (the Carter Bequest Hospital, Middlesbrough) to 38*s*. 9*d*. (Abercrombie Hospital Annexe, Chesterfield), the usual figure being about 22*s*.–26*s*. But one must turn to a voluntary body—King Edward's Hospital Fund for London—for an interpretation of what this low expenditure on food in mental hospitals means in terms of meals and nutriment. Mr. D. G. HARINGTON HAWES,[2] secretary of the Fund's hospital catering and diet committee, found that not only the low outlay on provisions, but out-of-date kitchen equipment, the very large numbers to be served, and the long distances which food must be carried, combine to make mental-hospital meals poor, unappetising, and repetitive. The study was made in the 47 mental hospitals in the Metropolitan area (since these alone come within the Fund's scope). Of these, 31 have more than 1000 beds, and most of them provide midday meals for both patients and staff—which means that 2500–3000 dinners have to be cooked in the same place and at the same time. HAWES noted that the maximum number of meals which can be cooked without loss of nutritive value and palatability, in a well-equipped well-staffed kitchen, is 1500. Mental-hospital kitchens are seldom adequately staffed or properly equipped. He gave a week's menu, however, from a mental hospital of over 2000 beds, where the equipment is good. The cost per head per week of feeding patients and staff was 15*s*., compared with 26*s*. for general hospitals in the same region.

> The main meal (meat, vegetables, and a pudding) was taken at midday; breakfasts and suppers were light; butter did not appear though margarine was taken at breakfast and tea; milk appeared only as a component of tea, cocoa, or custard; there were few green vegetables, and no salad, though fruit was taken two or three times in the week, either fresh or stewed.

HAWES commented on the "remarkable difference" between the standard of feeding in mental and general hospitals; but pointed out that money to buy provisions would meet only half the need: mental hospitals require decentralised kitchens, better equipment, and better catering. Only a detailed survey of all the mental hospitals, he said, could show how much such a programme would cost, and it might well run into millions: "nevertheless the need for improvement is so pressing that it must be undertaken."

These things, which do not appear in official analyses of types of disorder, recovery-rates, relapse-rates, and other matters of medical interest, are of paramount importance to patients and their relatives. This has been strongly emphasised, lately, by the League of Friends of Menston Hospital, Leeds, both in a memorandum sent to local Members of Parliament and in their evidence to the Royal Commission on the Law relating to Mental Illness and Mental Deficiency. This league of friends, composed mainly of relatives of patients in the hospital, emphasise the insufficiency of research into the cause and treatment of mental illness, the effects of overcrowding in mental hospitals, the "inequitable allocation of funds to the mental health service," and the nursing shortage. They note the lack of opportunity and encouragement for long-term mental patients to take part in occupational therapy—simply because there are too few staff to help them. Sitting, or walking aimlessly, in unattractive corridors and day-rooms, they offer "a depressing sight to any visitor and a heartbreaking one to relatives." As the nurses have not enough time to give any patient much individual attention, their reports on his day-to-day welfare are apt to be unsatisfying to his relatives, who may then feel he is being neglected; and this, the memorandum says, reflects unfairly on the nursing staff, who are usually doing their utmost in very difficult circumstances. In mental hospitals it is the task of the psychiatric social workers to take the place of the almoner and to help and reassure the relatives of patients; but this group of hospital friends, in their evidence to the Royal

1. London: H.M. Stationery Office. 1955. Pp. 8. 6*d*.
2. *Lancet*, 1955, i, 1214.

Commission, said that they had not had the opportunity to see the psychiatric social worker, and had not been told that they could approach her.

Information about the conditions in mental hospitals was recently contributed from another lay source. In the *Daily Express* [3] Mr. MERRICK WINN reported his investigation of 27 mental hospitals in England, Wales, and Scotland. In most of them he was appalled by the gross overcrowding, the lack of simple amenities, the restricted expenditure on food, the famine of nurses, and many other signs of the penurious way in which mental, as compared with general, hospitals have to be conducted. He writes of locked corridors used as dormitories or day-rooms, crowded beyond all reasonable capacity (100 women locked into a space which would barely take 70 comfortably; of 150 men in a ward designed for 80; of rooms "no bigger than a prison cell, with peeling plaster and damp streaked walls" big enough to take 2 beds and containing 4); of old decaying ill-equipped buildings; of "work-house" furnishings (shabby chairs, worn linoleum, dingy paint); and of the coldness of the wards in winter. He describes the herded patients, wearing shapeless hospital garments and without any personal possessions—or indeed any place to keep them if they had them; for beds set six inches apart leave no room for lockers, even if lockers could be supplied. These articles are vivid and moving and have been widely read. Mr. WINN is sincere and thoroughly justified in his determination to create a public demand for the reform of such evils. He does not blame the doctors or nurses: on the contrary he repeatedly says they are doing a creditable best against great odds. He blames an economic policy which ignores the outstanding needs of these hospitals, and of the thousands of our citizens in them—an indictment not, unfortunately, answered by the Ministry of Health's allocation of a "mental million," welcome though this was.

Of the 27 hospitals he visited he describes favourably only 2—Crichton Royal and Warlingham Park. Except presumably the members of the Board of Control, nobody is in a position to say whether the hospitals he visited were a representative cross-section of those in the whole country, or whether he had the ill-luck to pick, out of the total of 406, 25 of the worst and only 2 of the best. It is absurd that the very necessary information which would enable one to decide this point should not be accessible—both to the medical profession and the general public. For each region if not for the nation, there should be an annual report on the mental hospitals, giving such facts as the age of the hospital buildings, the degree of overcrowding, the ratio of nurses and nursing auxiliaries to patients, the number of occupational therapists and psychiatric social workers employed, the sanitary accommodation provided in relation to numbers of patients, the numbers of open and locked wards, the space between beds, the types of mattress, the number of lockers in relation to the number of patients, and the numbers of kitchen and catering staff employed. Admittedly such facts are not at present supplied for other kinds of hospital; but mental hospitals particularly require publicity for their work and needs—both because they are little visited and because adverse comments by their patients are easily set aside. The data collected at the board of control's inspections need to be supplemented, presented more conveniently, and given wider currency.

The Commissioners in Lunacy were originally appointed to look after the welfare of mental patients and to ensure that they were satisfactorily treated. Inheriting this task, the Board of Control have found it beyond their powers: the problem has grown too large, the hospitals too old, the nurses too scarce, the money too scanty for the board to be able to safeguard the patient's welfare in all the ways that it needs to be safeguarded. The board was not in fact constituted to bear the administrative burden now placed on its members. But a considerable step forward would be taken if they were enabled at least to produce a more useful annual report. At present the picture offered to the public is, to say the least, confusing. The Ministry of Health, struggling to get mental patients nursed, puts its spotlight on the mental hospitals with the best conditions, and encourages us to hope that conditions in all are coming up steadily, if slowly, to the standard in the best. Mr. WINN's spotlight, on the other hand, has been turned on some of those with the worst conditions, and he writes with just indignation at what he sees. Illumination of the whole scene is necessary: first because the public is entitled to know what is, and is not, being done in its name, and secondly because conditions cannot be greatly improved until many more people accept a share of the responsibility and decide to help.

3. *Daily Express*, Sept. 19, 20, and 21, 1955.

## Pneumonectomy

THE operation of radical pneumonectomy for bronchial carcinoma is based on sound surgical principles. Its aim is to remove in one block the lung and its fascial connections and lymphatic field. The first account of the operation—then called "block dissection pneumonectomy"—was given by Sir RUSSELL BROCK in 1948.[1,2] Since then other types of pneumonectomy with block removal of mediastinal nodes have been described.[3–6] BROCK and WHYTEHEAD [7] have now published a full account of their operation. Briefly this comprises division of the bronchus, incision of the mediastinal pleura over a wide field, dissection of the fascia and nodes back towards the hilum, opening the pericardium and dividing the pulmonary vessels within it, and removing the lung with the attached mass of pericardium, mediastinal pleura, areolar tissue, and lymph-nodes. BROCK and WHYTEHEAD emphasise the importance of securing the pulmonary vessels intrapericardially, so as to minimise interference with associated lymphatic structures. Whenever possible they secure the pulmonary veins first,[8] in an attempt to avert spread of tumour cells by the blood-stream during the operation; but they have found that often this precaution is not possible or expedient. In 145 patients operated on since 1947 the operative mortality was 11%. This was lower than the 18% mortality

1. Brock, R. C. *Brit. med. J.* 1948, ii, 737.
2. Brock, R. C. *In* Recent Advances in Surgery, edited by H. C. Edwards. London, 1948.
3. Cahan, W. G., Watson, W. C., Pool, J. L. *J. thorac. Surg.* 1951, **22**, 449.
4. Weinberg, J. A. *Ibid*, p. 517.
5. Kirklin, J. W., Jampolis, R. W. *Ibid*, 1953, **25**, 280.
6. Higginson, J. F. *Ibid*, p. 582.
7. Brock, R. C., Whytehead, L. L. *Brit. J. Surg.* 1955, **43**, 8.
8. Aylwin, J. A. *Thorax*, 1951, **6**, 250.

in 49 patients submitted to simple pneumonectomy during the same period. This simple-pneumonectomy group almost certainly contained more poor-risk patients; but the mortality with radical pneumonectomy was no higher than has been reported on several occasions with simple pneumonectomy. BIGNALL and MOON,[9] for instance, found a 13% operative mortality in 163 patients who had a pneumonectomy at the Brompton and London Chest hospitals in 1951 and 1952. BROCK and WHYTEHEAD state that the radical procedure is just as well tolerated as the less radical, even by those in the late sixties; they found a higher incidence of cardiac arrhythmias, but these usually responded quickly to treatment. They admit that the operation may be an extra burden in elderly poor-risk patients, in some of whom they have been content with a less radical removal. They compare the fate of the 129 who survived the radical operation with that of the 40 who survived simple pneumonectomy. But the two series may not be strictly comparable. The reasons for doing one operation in preference to another are not stated, but it is clear that the simple-pneumonectomy group contains, for instance, more elderly poor-risk patients. Of the simple-pneumonectomy patients only 13 (31%) survived for longer than two years; whereas in the series reported by BIGNALL and MOON the survival-rate two years after pneumonectomy was 46%, and similar rates have been reported by others. The patients have, moreover, been followed for different periods. All the 40 who underwent simple pneumonectomy were followed up for at least two years—the period during which there is the greatest risk of dying—compared with 109 of the 129 who had the radical operation. Only 3 in the simple-pneumonectomy group had not been followed either to death or for at least five years after operation, compared with 57 of those submitted to the radical procedure. It seems that the numbers who had a simple pneumonectomy decreased during the period, as the numbers in the radical group increased. BROCK and WHYTEHEAD state that 18% of the simple-pneumonectomy group are still alive, compared with 50% of those who had a radical pneumonectomy. But the former group has been observed longer, and the comparison as it stands is invalid. The evidence is hardly sufficient to support their admittedly cautious statement that "it seems not unreasonable to say that the figures afford strong evidence that radical pneumonectomy gives better results."

BROCK and WHYTEHEAD say that "the concomitant variables are doubtless so numerous that it is difficult to draw any firm conclusions." BIGNALL and MOON [9] have investigated the influence of some of these variables. They studied 453 patients who had a lung resection between 1940 and 1951 and confirmed that histological type and the apparent involvement of mediastinal nodes had a notable influence on survival. Thus the five-year survival-rate of those with enlarged nodes was only 11%, compared with 48% for those without. The prognosis was better in women than in men, but they detected no regular pattern of survival in relation to age. The survival-rates were lower in those with symptoms of six to eight months' duration than in those with either longer or shorter histories. It has previously been observed that the prognosis is worse with tumours in the left lung,[10] and BIGNALL and MOON found the lowest survival-rates in those with cancer involving the left lower lobe; the two-year survival-rate was 36%, compared with 47% for all sites and 57% for the right upper lobe. These workers suggest that some of the observed differences are due to selection. Probably more patients with upper-lobe tumours are rejected for surgical treatment, because of the nearness of the primary tumour to the supraclavicular nodes, recurrent laryngeal nerve, and superior vena cava—in which regions metastases are more easily detected than in the regional nodes draining the lower lobes. But they suggest also that the poor prognosis of tumours of the left lower lobe may be partly due to the peculiarities of its lymphatic drainage. Most of the lymph from the left lung is believed to pass to the right paratracheal chain of nodes, only a small proportion entering the blood-stream from the left paratracheal system.[11] Metastases from tumours of the left lower lobe may therefore be present in the right hemithorax at the time of operation; but they are unrecognised and inaccessible, and they would not be removed even with the radical pneumonectomy of BROCK and WHYTEHEAD. If this operation does give a higher survival-rate than simple pneumonectomy it might be expected that the difference would be smallest in those with tumours of the left lower lobe—a hypothesis that can be tested when more cases have been recorded.

In the surgery of lung cancer the radical approach may be right; but it is unlikely to go unchallenged. Simple pneumonectomy with piecemeal removal of suspiciously involved nodes has many supporters. Moreover, the merits of lobectomy may be re-examined now that many surgeons have accumulated large series of cases. Comparison between the results of pneumonectomy and of lobectomy is especially difficult, for in the past patients submitted to lobectomy had, in general, less advanced disease. In the series described by BIGNALL and MOON many more who had a lobectomy had no macroscopic evidence of node metastases; and their prognosis would be expected to be better. But the survival-rates of the 30 patients without enlarged nodes who survived a lobectomy were almost the same as the corresponding 20 who survived a pneumonectomy. BIGNALL and MOON conclude that there is "no convincing evidence that the chances of survival of those who lived through the postoperative period were materially affected by the extent of resection the surgeons considered advisable for the particular patient." Comparisons between lobectomy and pneumonectomy must take account of the operative risk; and here lobectomy has a clear advantage. During 1950 and 1951 13% of those who underwent a pneumonectomy died within two months of operation, but all of the 42 who underwent lobectomy survived. During the whole twelve-year period covered by the investigation, only 2 of the 74 patients treated by lobectomy died in the early postoperative period. Even if the risk of recurrence and death were greater after a lobectomy the operation might still be worth while, for the immediate risk of dying is so much smaller than that of a pneumonectomy.

But survival-rates tell only part of the story. Does a patient with four lobes live a more comfort-

9. Bignall, J. R., Moon, A. J. *Ibid*, 1955, **10**, 183.

10. Carlisle, J. C., McDonald, J. R., Harrington, S. W. *J. thorac. Surg.* 1951, **22**, 74.

11. Warren, M. F., Drinker, C. K. *Amer. J. Physiol.* 1942, **136**, 297.

able and normal life than one with only two or three? It is reasonable to think that he should; and, although there is no statistical evidence to support this, clinical impressions suggest that he does. The radical treatment of lung cancer advocated by BROCK and WHYTEHEAD cannot yet be accepted as the best treatment.

## Annotations

### TONSILLECTOMY AND RESPIRATORY INFECTIONS

THE indications for tonsillectomy may seem to be based more on intuition than on reason. Evaluation of the results, by differing methods of assessment,[1–4] has already cast serious doubt on the value of the operation. Among the lexicon-like list of reasons for undertaking it, repeated respiratory infections (and what child does not have them?) has been well to the fore. Now McCorkle et al.[5] have made a painstaking assessment of the relation of tonsillectomy to the incidence of such infections. This study can be faulted at only one point—the small numbers concerned. But the 230 children studied were observed for up to five years, during which the mothers kept a daily health record, field workers paid a weekly visit, and physicians assessed all illnesses with the help of extensive bacteriological investigations.

The results are presented under two headings. Under the first heading "the age-specific rate of infection" of two groups of children—tonsillectomised and not, before the period of observation began—is compared. Under the second heading is shown "the age-adjusted rate of infection" in a group of 26 children who, because they had a higher than expected rate of infection, were operated on during the period of observation. McCorkle et al. state: "Comparison of these data requires the use of either age-specific or age-adjusted rates because the incidence of common respiratory illness changes with age, and post-tonsillectomy experience is heavily weighted with older children." The outcome of this study was that the operation had no effect at all; and the 26 children with a higher than expected rate of infection continued unchanged at the higher rate after the operation.

The great care with which this study was conducted suggests that, though the numbers were small, the results would be the same whatever the total.

### WEIGHT-GAIN IN INFANCY

THE importance of recording reliable anthropometric data in childhood is only now being fully recognised.[6] During and since the late war valuable contributions have been made by H. C. Stuart, A. H. Washburn, N. C. Wetzel, and others in the U.S.A., by workers at the Institute of Child Health, University of London, directed by A. A. Moncrieff, and by J. M. Tanner and R. W. B. Ellis.

Thomson[7] has studied the weight-gain during the first year of life of infants at a child-welfare clinic in Edinburgh. The observations were made monthly on legitimate, singleton, first-pregnancy infants whose birth-weights were within the range of over $5\frac{1}{2}$ to $9\frac{1}{2}$ lb.; 1737 observations were made on males and 1605 on females. Thomson confirmed that throughout the first year the mean weight-gain of the male is greater than that of the female; for instance, the mean weight-gain in the male at 26 weeks was not attained until 3 weeks later by the female, and the weight attained by the female at 1 year was reached by the male 8 weeks earlier. Thus there is ample justification for recording and assessing the weight pattern separately according to sex. Despite this differing pattern, Thomson found that the proportion of the total weight-gain in the first year at particular ages was the same in the two sexes; for instance, in both sexes a quarter of the total weight-gain was attained at 10 weeks, half at 20 weeks, and three-quarters at 32 weeks. This study strongly suggests that in singleton infants born at term birth-weight is unrelated to the rate of postnatal weight-gain. Accordingly in assessing progress the rate of weight-gain is much more important than the actual weight—a fact appreciated by experienced clinicians. Comparison with the careful recordings of Finlay[8] in Edinburgh thirty years ago showed that the mean weight at 1 year is now 30 oz. greater. This is probably a fair reflection of the improvement in development and health in infancy throughout the country during this period of rising economic and nutritive standards. Thomson rightly emphasises that the standard graph weight-cards used in most local-authority clinics are out of date, and should be revised to provide norms which accurately reflect the improved development of infants nowadays.

Parents who show an interest in the weight of their infants should be told that standard weight-for-age charts are based on the average weights of many infants; otherwise they tend to be alarmed by weights that are not close to the average but which may be quite normal for their infant. If their infant is to be weighed at all it should be weighed methodically and accurately, as at most child-welfare clinics; and the influence of factors such as race, heredity, and prematurity on the actual weight should always be borne in mind. Provided a baby looks healthy and seems to be making good progress it is a mistake to focus attention on weight-gain, since normal irregularities in the rate of gain are often misunderstood by parents and cause them much unnecessary worry. Routine weekly weighing is desirable in the first month or two of life; but thereafter it should be done at lengthening intervals, provided the general progress is satisfactory, and between the ages of 6 months and 1 year 2-monthly weighing suffices.

### THE LUNGS IN EMPHYSEMA

DURING a pause in respiration the pressure at the surface of the lungs is lower than that at the mouth, because of the elastic pull of the lungs. To produce inspiration, the pressure at the surface of the lungs has to be lowered still further and the fall which takes place is a measure of the force required. This force has to overcome two mechanical factors: the elastic pull of the lungs, which increases as the lung is distended, and the resistance to airflow when air moves through the respiratory passages. When expiration takes place these factors are again in operation. In order to analyse the mechanics of respiration it is necessary to separate the effects of airflow resistance from those of the elastic tension of the lungs, and, although technically difficult, this can be done graphically or, as Mead et al.[9] now report, by plotting the variables with a cathode-ray oscilloscope.

Mead et al. examined the mechanical properties of the lungs in 10 healthy people and in 10 patients with emphysema. They found that during quiet breathing pulmonary flow resistance was greater in the patients than in the healthy people throughout the respiratory cycle, but especially during expiration when it was

1. Kaiser, A. D. *J. Amer. med. Ass.* 1930, **95**, 837.
2. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1938, no. 227.
3. Paton, J. H. P. *Quart. J. Med.* 1943, **12**, 119.
4. Walker, J. S. *Arch. Otolaryng., Chicago*, 1953, **57**, 664.
5. McCorkle, L. P., Hodges, R. G., Badger, G. F., Dingle, J. H. Jordan, W. S. *New Engl. J. Med.* 1955, **252**, 1066.
6. Tanner, J. M. *Arch. Dis. Childh.* 1952, **27**, 10.
7. Thomson, J. *Ibid*, 1955, **30**, 322.
8. Finlay, T. Y. *Edinb. med. J.* 1924, **31**, 317.
9. Mead, J., Lindgren, I., Gaensler, E. A. *J. clin. Invest.* 1955, **34**, 1005.

about 30 times as great. Moreover, in the patients the flow resistance during expiration was greater than during inspiration, whereas in the controls this was not so. When the subjects hyperventilated the pattern changed. In patients and controls the flow resistance during rapid inspiration was approximately the same as it was during quiet breathing; but during rapid expiration the flow resistance in both patients and controls greatly increased, though the peak flow resistance in the patients was about 10 times as great as in the controls. The finding that in healthy people expiratory flow resistance is greater than inspiratory resistance during hyperventilation, but not during quiet breathing, is not unexpected. During quiet breathing, even in expiration, the pressure on the outside of the respiratory airways—certainly the extrapulmonary ones—more closely approximates to the still-negative intrapleural pressure than to the pressure within the airways, and the difference tends to keep the tubes expanded. But during rapid forced expiration this pressure difference is reversed and the calibre of the airways is reduced, thus increasing the pulmonary flow resistance. Conversely, during inspiration the pressure on the outside of the airways falls and tends to increase their calibre. Bronchoscopists can vouch for the pronounced narrowing of the larger bronchi during forced expiration. Mead et al.[9] cite several structural changes that might result in the abnormal compression of the airways which their findings suggest occurs in emphysema: reduction in cross-section of the smaller airways, increased tissue frictional resistance, weakening of the structure of the bronchial walls, and a tendency for the airways to collapse due to reduction of lung elasticity.[10]

As regards lung elasticity, Mead et al. found that under "static" conditions the lungs of emphysematous patients were more distensible than normal: that is, if the subjects took a slow maximal inspiration and kept their glottis open, it was found that for a unit fall in pressure at the surface of the lungs a bigger volume of air entered the lungs of an emphysematous patient than entered the lungs of a healthy person. They also confirmed an observation, first made by Christie,[11][12] that in emphysematous patients, unlike normal subjects, the lungs apparently become less distensible as the rate of breathing increases. Experimentally they threw some light on this phenomenon. First they measured the distensibility of a dog's lungs and then completely blocked the left main bronchus with a balloon. They found that the distensibility of the lungs was almost halved, because when a given volume of air was inspired the right lung had to be distended to accommodate all of it instead of accommodating a little over half as it would have done had the left lung been working normally. Next they deflated the balloon so that the left main bronchus was only partly blocked. During quiet breathing air went in and out of the left lung almost as it did when the left main bronchus was clear, and the distensibility of the lungs was normal. But when the rate of respiration was increased the picture altered—the faster the breathing the less the volume of air which went in and out of the left lung, until at very rapid rates almost all the air went in and out of the right lung and the volume of the left lung scarcely changed. Also, the distensibility of the lungs decreased as the rate of breathing increased until at very rapid rates the distensibility of the lungs fell to what it had been when the left main bronchus was completely obstructed by the balloon. At slow rates of breathing, therefore, the increase in flow resistance produced by partial obstruction of the left main bronchus was negligible, but at rapid rates there was virtually complete functional block of the bronchus.

If it is supposed that in emphysema there are numerous partly obstructed respiratory channels this mechanism could explain why the lungs apparently become less distensible as the rate of breathing increases: at slow rates air will move with little difficulty in and out of the affected areas of lung, but at rapid rates it will tend to avoid them and be accommodated in normal neighbouring parts of the lung. In effect, therefore, at high rates of breathing the more normal parts of the lungs will have to be distended to accommodate air which at lower rates would be received in partly obstructed areas, and thus the distensibility of the lungs will apparently decrease. Mead et al. also point out that this mechanism could explain the development of emphysema in cases of bronchial asthma and chronic bronchitis. During the deep, rapid inspiration which follows coughing little air will enter partly obstructed areas of lung, and the consequent overdistension of neighbouring normal areas will be likely to lead eventually to structural damage. This is certainly an interesting hypothesis.

10. Fry, D. L., Ebert, R. V., Stead, W. W., Brown, C. C. *Amer. J. Med.* 1954, **16**, 80.
11. Christie, R. V. *J. clin. Invest.* 1934, **13**, 295.
12. McIlroy, M. B., Christie, R. V. *Thorax*, 1952, **7**, 291.

## THE ANAL SPHINCTERS

THE anatomy of the anal canal provides a salutary reminder of the imperfection of our powers of observation. Thompson's[1] classic description of the anal sphincter was neglected for over thirty years until it was utilised clinically by Milligan and Morgan[2]; but even then anatomical textbooks continued to take no account of it. Thompson found that the external sphincter consisted of three parts: a subcutaneous part, a superficial part which lay deeper, and above this the deep external sphincter. Milligan and Morgan regarded the subcutaneous part as separate from its two fellows; it was unattached to perineal body in front or to coccyx behind. Was it not this loose "umbrella ring" that was seen in the floor of a chronic fissure, and its contraction, due to spasm and fibrosis, the reason for the persistence of the fissure? The argument was carried a stage further by the suggestion that spasm of the muscle brought about the condition, with models in 'Plasticine' to prove the point.[3] "The subcutaneous sphincter ani externus is the structural cause of fissure-in-ano. . . . Division of the subcutaneous external sphincter ani and enlargement of the skin wound is the radical cure. We may now fairly claim to know both the cause and cure of fissure."[4] Ball's[5] hypothesis that fissure was due to the tearing down of an anal valve had proved unsatisfactory since many a fissure did not extend to that level; besides the treatment suggested by the St. Mark's Hospital group[4] cured the condition. Meanwhile the internal sphincter wilted under neglect. But doubt remained in some minds[6]; for why should the muscle, seen in dissection undertaken for fissure and termed external sphincter, appear so pale—too pale, it would seem, for somatic origin? Now we have the answer from St. Mark's Hospital itself. By placing thread sutures, before the patient was anæsthetised, through the lower borders of external and internal sphincters identified by palpation, Goligher et al.[7] have shown that with relaxation due to anæsthesia the external sphincter retracts laterally and the muscle seen in the base of a fissure is indeed the lower end of the internal sphincter—an observation confirmed by biopsy revealing smooth muscle. They have further demonstrated that this part of the internal muscle is divided into discrete elliptical bundles; this accounts for the view[2] that the lower part of the "external" sphincter was a separate entity without attachments. The division of the external sphincter into three parts must be regarded as an anatomical observation resulting from the dissection of

1. Thompson, P. Myology of the Pelvic Floor. London, 1899.
2. Milligan, E. T. C., Morgan, C. N., Jones, L. E., Officer, R. *Lancet*, 1937, ii, 1119.
3. Gabriel, W. B. Principles and Practice of Rectal Surgery. London, 1945; p. 130.
4. Milligan, E. T. C. *Proc. R. Soc. Med.* 1943, **36**, 365.
5. Ball, C. The Rectum. London, 1910.
6. Eisenhammer, S. *S. Afr. med. J.* 1953, **27**, 266.
7. Goligher, J. C., Leacock, A. G., Brossy, J. J. *Brit. J. Surg.* 1955, **43**, 51.

cadavers, since Goligher et al. have observed no clear indication of this and have further noted that the external sphincter is continuous in its upper part with the puborectalis portion of the levator ani muscle.

The wheel has come full circle, for the internal sphincter is reinstated and restored to its full size; it is a muscle to be reckoned with—and cut for fissure. The importance of the external sphincter recedes. How many decades will elapse before the textbooks of anatomy, which have at last accepted the Thompson-Milligan-Morgan thesis, catch up with these new disclosures? And what does cause fissure-in-ano?

## TREATMENT OF MALARIA

DESPITE the dramatic effects of the residual insecticides in controlling malaria, this disease is still one of the commonest in the world, and there is a potential danger that sudden abnormal conditions might precipitate an epidemic in circumstances where control by insecticides would be difficult. Moreover, it is not certain that anopheles mosquitoes will remain sensitive to the insecticides; indeed there is evidence from Greece that some species are showing resistance. Accordingly effective treatment is still essential in parts of the world (including vast areas of Africa) where malaria is endemic, and in countries, such as Britain, where the disease in patients from hot countries may present serious problems to doctors unfamiliar with it. After the 1914–18 war there were many cases in which malaria was diagnosed too late for effective treatment; and there must have been many more in which it was not diagnosed at all—with disastrous results when the infection was due to *Plasmodium falciparum*. After the 1939–45 war there were again deaths; yet the drugs were there, and treatment is comparatively simple.

The wars gave a strong impetus to research for drugs to replace quinine. The development of compounds containing the quinoline ring has been most successful in the case of the 8-aminoquinolines, such as pamaquine and related substances including primaquine, and the 4-aminoquinolines, such as chloroquine and amodiaquine. These 4-aminoquinolines have largely supplanted mepacrine, in which the quinoline ring of plasmoquine was replaced by an acridine ring in an effort to reduce toxicity; but mepacrine was the first of the new synthetic drugs to be used on a massive scale as a suppressive. It proved invaluable during the campaigns in malarious countries in the war of 1939–45; its remarkable power, when taken in small daily doses, of preventing overt attacks was proved beyond doubt by the classical work of Hamilton Fairley and his colleagues at Cairns in Australia during the war. Careful research by British teams has led to the introduction of proguanil and pyrimethamine, whose value is greatest in prevention.

With one or other of these substances, or quinine (which still has a place in the treatment of severe attacks), the malaria parasites can now be attacked at most of their life stages. For this we are indebted to German, British, and American scientists, who tested enormous numbers of compounds against the malaria parasites of birds. The time has come when these massive contributions to chemotherapy can be evaluated—a task that has been successfully accomplished in a W.H.O. monograph.[1] This excellent monograph will be especially useful in malarious countries; but it should also be in the library of all hospitals in temperate countries where malaria patients are likely to be treated, and in all medical schools.

In this country we have tended to neglect malaria except in war-time, and perhaps only those who have seen the disease are aware of the tragedies which may result from ignorance of it. It is important that practitioners in Britain should bear in mind the possibility of malaria (and indeed of other tropical diseases); and, as has already been suggested, it would be wise to set aside on each hospital case-sheet a space in which the patient's geographical history would be entered as a routine. The treatment of malaria is not difficult if the diagnosis has been made promptly; but delay in diagnosing *P. falciparum* infections may result in the patient's death.

1. Covell, G., Coatney, G. R., Field, J. W., Singh, J. Chemotherapy of Malaria. W.H.O. Monograph Series, no. 27. H.M. Stationery Office, 1955. Pp. 121. 17s. 6d.

## CARDIAC AND ŒSOPHAGEAL PAIN

THE diagnosis of cardiac pain does not usually present difficulty. Such pain may occur in the absence of coronary-artery disease—for example, in rheumatic valvular disease and in anæmia—or as true angina pectoris in coronary-artery disease.[1] The character, distribution, and relation to exercise of angina of effort are usually so characteristic that objective evidence of ischæmic heart-disease is not required—which is fortunate since signs are often lacking. On the other hand angina pectoris at rest due to cardiac infarction is almost always accompanied by electrocardiographic abnormality. But angina may occur at rest without cardiac infarction in acute coronary insufficiency.[2] Administration of nitroglycerin does not help greatly in the diagnosis of angina pectoris[1]; for it may relieve pain due to other causes.

Gastro-œsophageal pain may resemble cardiac pain.[3–7] Whether reflexes from the alimentary tract affect the coronary circulation is uncertain; the exact action of the vagus and the sympathetic nerves on the heart in the intact animal is obscure.[8] Baylis et al.[9] have studied the œsophagus as a source of pain resembling that of angina pectoris, by distending a rubber bag in the lower œsophagus in 8 healthy people and in 3 patients with coronary-artery disease. Inflation of the bag was accompanied by œsophageal activity of the type described by Payne and Poulton[10] and by pain. The pain was similar in the healthy subjects and in the patients; the patients found that it differed from their angina pectoris, but they were unable clearly to define the difference. (Master et al.[11] had previously observed that pain in hiatus hernia was only exceptionally like angina pectoris.) Baylis et al. found that œsophageal distension did not produce electrocardiographic changes which could be confused with those of myocardial ischæmia; and, like Evans,[3] they conclude that the electrocardiogram is the most reliable special method of distinguishing cardiac from œsophageal pain. If the resting electrocardiogram is normal an effort test, with proper precautions, may be necessary.[12 13]

The existence of another pathological condition capable of producing similar pain does not automatically exclude ischæmic heart-disease—hiatus hernia, for example, is diagnosed with increasing frequency.[14 15] On the other hand, it is obviously important to avoid a wrong diagnosis of angina pectoris. Ballistocardiography, though its value has not yet been fully proved,[16–18] may give some additional help. Quantitative estimation of the amount of cardiac muscle destroyed after infarction may soon be

1. Parkinson, J. *Lancet*, 1951, ii, 695.
2. Master, A. M. *Ann. intern. Med.* 1944, **20**, 661.
3. Evans, W. *Lancet*, 1952, ii, 1091.
4. Guyot, R., Blum, J. *Arch. Mal. Cœur*, 1949, **42**, 544.
5. Jackson, D. E., Jackson, H. L. *J. Lab. clin. Med.* 1936, **21**, 993.
6. Jones, C. M. *New Engl. J. Med.* 1941, **225**, 963.
7. Jones, C. M., Chapman, W. P. *Trans. Ass. Amer. Phycns*, 1942, **57**, 139.
8. Gregg, D. E. Coronary Circulation in Health and Disease. London, 1950.
9. Baylis, J. H., Kauntze, R., Trounce, J. R. *Quart. J. Med.* 1955, **24**, 143.
10. Payne, W. W., Poulton, E. P. *Ibid*, 1923–24, **17**, 53.
11. Master, A. M., Dack, S., Stone, J., Grishman, A. *Arch. Surg., Chicago*, 1949, **58**, 428.
12. Master, A. M., Friedman, R., Dack, S. *Amer. Heart J.* 1942, **24**, 777.
13. Wood, P., McGregor, M., Magidson, O., Whitaker, W. *Brit. Heart J.* 1950,363. **12**,
14. Harrington, S. W. *J. thorac. Surg.* 1938, **8**, 127.
15. Hodson, C. J. *Proc. R. Soc. Med.* 1954, **47**, 534.
16. Starr, I. *Amer. J. med. Sci.* 1947, **214**, 233.
17. Starr, I. *J. Amer. med. Ass.* 1954, **155**, 1413.
18. Starr, I., Hildreth, E. A. *Circulation*, 1952, **5**, 481.

possible; studies on glutamic oxalacetic transaminase in the serum appear to show a relation between its activity and the extent of infarction.[19]

## THE DANGERS OF CITRATED BLOOD

A YEAR ago Cookson et al.[20] reported the results of massive transfusion of citrated blood in dogs in which they simulated the conditions of cardiac operations. They found that citrated blood greatly depressed cardiac action, by comparison with the effect of transfusions of heparinised blood under the same conditions. Bunker et al.[21] have carefully studied the chemical changes in the blood during moderate to massive blood-transfusions in 130 clinical cases. 33 adult patients in this series received citrate at the rate of less than 0·5 mg. per kg. body-weight per minute and suffered no decrease of serum-ionised-calcium. But of 15 patients with advanced hepatic disease who received transfusions at the same rate 9 had relatively high serum-citrate levels, and in 5 of these the ionised-calcium level of the serum fell below normal. The serum-ionised-calcium tended to decrease in both groups of patients if the rate of infusion of citrate was increased to 1 mg. per kg. per minute. Of 28 patients in whom the serum-citrate level rose high enough to depress the serum-ionised-calcium level below normal, 5 had serum-ionised-calcium levels of 0·55 milli-mol. per litre or less. This level Bunker et al. regard as critical, since the isolated frog's heart preparation of McLean and Hastings stops beating when the ionised-calcium level in the perfusate drops to 0·5 milli-mol. per litre.[22] In 3 of the 14 patients whose blood-clotting time was measured this was prolonged, but Bunker et al. could not correlate this finding with depression of ionised calcium in the serum. On the other hand Stefanini [23] found distinct prolongation of clotting-time in vitro when the ionised calcium level fell to 0·5 milli-mol. per litre.

Treatment of established citrate intoxication is by injection of calcium chloride or calcium gluconate. There is danger of overdosage, and it is difficult to calculate the right amount. Unfortunately treatment does not always alter the serum-ionised-calcium level,[24] and calcium gluconate may even increase the serum-citrate level still further.[25] Citrate is metabolised in the liver [26–28] and muscles [29] and is excreted and concentrated in the urine by the kidneys,[30] so the risk of citrate intoxication should be remembered where massive transfusion is necessary for patients with hepatic or renal disease. Citrate metabolism depends on the activity of the Krebs cycle, which is depressed by anæsthesia with barbiturates [31] and possibly by hypothermia [21]; and the advisability of using citrated blood for transfusion in operations under these conditions should be questioned. Alternative blood preparations have been suggested, such as oxygenated red cells suspended in Ringer-Locke-gelatin solution,[29] red cells suspended in salt-free dextran,[32] and blood from which the calcium has been removed by passage over an ion-exchange resin.[21] These all have disadvantages, not the least of which is the complexity of preparation.

19. LaDue, J. S., Wroblewski, F. *Ibid*, 1955, **11**, 871.
20. Cookson, B. A., Costas-Durieux, J., Bailey, C. P. *Ann. Surg.* 1954, **139**, 430. See *Lancet*, 1954, ii, 127.
21. Bunker, J. P., Stetson, J. C., Coe, R. C., Grillo, H. C., Murphy, A. J. *J. Amer. med. Ass.* 1955, **157**, 1361.
22. McLean, F. C., Hastings, A. B. *J. biol. Chem.* 1934, **107**, 337.
23. Stefanini, M. *Acta med. scand.* 1950, **136**, 250.
24. Smith, H. *Brit. med. J.* 1955, i, 1089.
25. Mellone, D., Yahn, O. *Arq. Cirurg. clin. exp.* 1949, **12**, 369.
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## ADDENDUM TO BRITISH PHARMACOPŒIA

THE shrewd observer may now discern the outlines of the *British Pharmacopœia 1958*. The *Addendum 1955* to the *British Pharmacopœia 1953*, now published,[1] is more than a list of amendments: it is a substantial supplement. The principal alterations are succinctly described in the introduction:

"There are monographs on the antimalarial drugs Chloroquine Phosphate and Chloroquine Sulphate, the anthelmintic drug Diethylcarbamazine Citrate, the ganglion blocking agent Hexamethonium Tartrate, the muscle relaxant substance Suxamethonium Chloride, the anti-convulsant drug Primidone, the local anæsthetic Lignocaine Hydrochloride, the radio-opaque substance Iopanoic Acid, and on Isoniazid, which is used in the treatment of tuberculosis. Other new monographs provide official standards for Ferrous Gluconate, the anti-thyroid drug Carbimazole, the anticoagulants Phenindione and Dextran Sulphate, and the antibiotics Oxytetracycline Dihydrate and Oxytetracycline Hydrochloride. Hormone preparations are represented by Cortisone Acetate, Corticotrophin, and three preparations of Insulin termed Insulin Zinc Suspension, Insulin Zinc Suspension (Amorphous), and Insulin Zinc Suspension (Crystalline). There are also monographs covering the forms in which the new chemical substances are administered, namely, injections and tablets."

Among other drugs in the list are gallamine triethiodide ('Flaxedil'), a muscle-relaxant; nalorphine, a valuable antagonist to morphine; methylamphetamine (presumably included on the ground that it has a more selective action than has amphetamine on the central nervous system); and phenylbutazone (it is noteworthy that the recommended daily dosage is conservative—0·2 g.–0·4 g. in divided doses). There are also soluble tablets of acetylsalicylic acid—a gesture to present-day fashion (vide *National Formulary 1952*). Modern trends in the practice of dispensing are revealed by the fact that in this short list of addenda there are no less than twenty preparations in tablet form; but compound tablets are notably absent.

The art of describing preparations and procedures concisely, accurately, and without ambiguity is essential in the practice of pharmacy. A hint of the amount of labour that goes into this subject appears in the paragraph on distilled water:

"Distilled Water has been described in successive editions of the Pharmacopœia since the first issue in 1864. Water for medicinal and pharmaceutical purposes may now be prepared from potable water by distillation or by treatment with ion-exchange materials. Both methods of preparation are now official and the title of the monograph is changed from 'Distilled Water' to 'Purified Water.' Additional requirements for purity have been added and the references to 'Distilled Water' throughout the British Pharmacopœia 1953 are changed to Purified Water. It is directed that when Distilled Water is prescribed or demanded Purified Water shall be dispensed or supplied. It should be noted that Injections are made with Water for Injection, and Purified Water is unsuitable for the purpose."

We are growing accustomed to the use of English as the main title for substances and their preparations dealt with in the monographs. It is easy to exaggerate the virtue of consistency, but at the present rate of progress the time may not be far distant when Latin will no longer be used even for the official synonyms of the older galenicals.

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ON the retirement of Surgeon Vice-Admiral Sir ALEXANDER INGLEBY-MACKENZIE at the end of next April, Surgeon Rear-Admiral R. C. MAY will succeed him as medical director-general of the Navy.

Prof. R. C. GARRY and Mr. H. J. SEDDON have been appointed members of the Medical Research Council.

1. Published for the General Medical Council by the Pharmaceutical Press, 17, Bloomsbury Square, London, W.C.1. Pp. 94. 21s.

## Special Articles

# THE EMOTIONAL DEVELOPMENT OF CHILDREN*

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Freud's conception of the unconscious and his analytical observations have already shared the fate of other theories—being at first strongly refuted and later diffusely accepted. They might be left at that, but for two special features. Firstly, if analytical concepts are true and the individual's character is mainly formed during the first five years, it would affect us all equally and directly. Secondly, if irrational unconscious forces are active in us all our lives, this might explain why our lives are often so precarious, and so rarely satisfying.

We cannot, in fact, afford to ignore a tool which might, used fully, help us to prevent breakdowns and even to know ourselves and shape our destiny. But a critical reassessment of these concepts is necessary before they can be effectively applied.

### THE NEWBORN INFANT

According to analytical experience a newborn baby is as capable of feeling fear and anxiety as of feeling happiness or contentment. He does not represent a brand-new life, but a continuation of millions of lives before him; and what is more likely than that traces of earlier phases of development and experience have remained, which are active from the moment of his independent existence? In all organs, earlier, long obsolete, phases of development are recapitulated during intra-uterine life. Why should the organ showing highest development be uninfluenced by either past experiences, or lack rudiments on which later function is built? The electro-encephalogram shows a steady development from the time of birth to maturity: there is no sudden emergence of new waves to suggest a new function appearing later.†

If we accept that even the newborn infant has some form of emotional life, we can begin to look at him objectively and experimentally, asking ourselves what form this emotional life takes. The adult personality has three components—an instinctual core; a partly conscious, volitional ego; and a critical, demanding part, sometimes called the super-ego. Of these three the infant can possess only the first—the instinctual core. This is the oldest—the inherited—live core of all personality, round which consciousness slowly develops, and into which impressions of authority become incorporated.

In the infant the instinctual drive is expressed through feeling: he desires to be fed, loved, protected. Instincts are egocentric, know no tolerance, and are timeless and irrational. Even at this point the child is linked with the rest of humanity by his capacity for fantasy. Physically he is powerless and dependent, but in fantasy he is limitless. When his desires are fulfilled and not hampered by his own weakness he feels omnipotent. When he is frustrated, however, his fantasies may produce fears out of proportion to any actual threat. This capacity for fantasy surely explains why the baby a few weeks old cries so bitterly when handled by a stranger, jumps at a noise, or resents any change. If he imagines good things to be wholly good, and bad things—or those which seem bad or unwanted—to be wholly destructive and terrifying, his exaggerated responses become understandable.

### THE FIRST SIX MONTHS

During the first three months he must form his most inaccessible, deepest picture of the world he has been born into. His instincts, when satisfied, give him peace and repose; when frustrated they become an irritation and a threat. What limited means he has at his command he uses fully to express his inmost feelings. He displays rapid interchanges of love and hate, happiness and misery, and every other opposite emotion. That children have very fluid emotions has long been known. Each feeling while it lasts is of great strength. The infant is not able at first to control these feelings, but his very desire to survive helps him to acquire responses which he finds approved, and to discard others which are frowned upon. Substitute gratifications help him in times of frustration. He sucks his fingers in place of the satisfying breast. Later, bits of wool, toys, any object he can lay his hands on, will be imbued with magical soothing qualities: hence his obvious satisfaction on finding his favourite object, and his distress at losing it. He also begins to acquire some of the mental magical tricks which will throughout life assist him; he turns a blind eye on something he does not like, splits the image into two, and thereby saves himself the difficult task of discrimination. If he can see separately a good mother and a bad one, he is able to love the good without reservation and hate the other without guilt.

The next three months seem like a truce. The most dissatisfied baby settles down somewhat and finds a modus vivendi—a compromise between his own demands and his satisfactions.

### SIX MONTHS TO TWO YEARS

The period from 6 months to 2 years has been called the phase of maximum aggression.

If we consider what is happening in his physical world at this time his violent mental reaction becomes comprehensible. In the first place, his teeth are nagging in his jaws. To the primitive mind physical pain is very much like deprivation. Before man had science, he had magic: illness was a visitation from an unseen, hostile power. The infant, like a savage, feels angry and resentful at being thus visited. Again, the hitherto horizontal creature begins to sit up, then crawl and finally walk; he learns to make recognisable sounds; and he acquires the rudiments of toilet training. All these major tasks could not be accomplished without very powerful urges. If he was completely happy in his dependent state, he would have no reason to try to change it; but his very strong frustrated desires urge him, push him, to make new attempts at controlling his situation.

At this stage, then, instinctual desires become bodily urges, and are given added strength by the ability to bite, chew, touch, reach, and destroy objects. His imagination is at its most active, because control is only slowly being acquired. He not only reaches out physically; he also reaches out imaginatively. He gets "into touch," in every sense of the word with reality, and is able to test his ideas, and discard or modify them according to experience. If, in his imagination he chews and bites people, as well as objects, and if he is concurrently punished for some deed, he takes this to be a reprimand for his own destructive thoughts. He feels guilty.

But if these instinctual desires are as powerful as we believe, how is it that within a few years the child

* Based on a talk given at Salford on Feb. 28, 1955.

† To produce electricity at all, there must be two opposing forces. We know that in muscular activity the antagonists are as important as the agonists. It is the former which provide the smooth basis on which the latter can act purposefully. The two groups, "paired off," produce between them flexibility and firmness. In our emotions very much the same appears to be the case and every emotion is linked with its opposite. This might explain both the quick interchange and the need for establishing, through practice, paths through which our emotions can flow. It also explains how one type of feeling has, incorporated at its base, the exact opposite.

becomes almost as civilised as an adult—whereas the race as a whole has taken thousands of years to achieve the same result? Surely because he is helpless, fluid, and impressionable. His foremost need is for love, without which he cannot survive; and in order to get love he must conform. Conformity, in every culture, takes the form which adults set for him. If he did not imagine that disapproval means rejection, and a threat to his need for love, he would hardly be able to counter his impulses as successfully as he does. The child's desire to be loved and accepted is the basis of all civilisation. The quality of love which he gets decides in turn, how much of his energies will be freed for exploration and how much spent in battles with himself. Mental strife is at all times energy-consuming; but at the stage when the child establishes his first contact with reality, a damming up of energy may be detrimental to all his later development. Energy in the mental world behaves like physical energy: denied legitimate outlet it makes its escape through other channels.

The child, in the time of his physical helplessness, is living a rich and crude fantasy life, and interpreting events in the real world in a distorted form. He relates all behaviour and all events around him to himself, almost like a paranoiac. Good and bad impress him, and the adults of his childhood are models for life. Even when he rebels against a particularly hard-to-attain adult standard, such as cleanliness, he will have absorbed that attitude and may in later life be obsessed with the idea of meticulous orderliness at the expense of his emotional freedom.

Being loved and accepted, mean to him the acceptance of some degree of badness in himself. If all the badness in him is rejected, he will feel alone and deserted at the very moment when his own antisocial demands are tending to isolate him. He responds to demands and prohibitions just as much as to love, but the result of the two in his mental economy, is vastly different. When he discards, or attempts to give up, a piece of behaviour which is strongly disapproved, he feels that this disapproval of a part refers to the whole: he feels rejected and frightened, and fears that he may lose the parent's love. His instincts urge him to seek satisfaction, his parents disapprove, he must do battle within himself; being as yet, very loosely organised and having weak defences and strong urges, he is unlikely to succeed. He will feel that there is something undesirable, bad, in him; he will in fact know the meaning of guilt. It is a characteristic which survives into adult life, that we cannot bear internal guilt: we must fix it somewhere outside, we must try to find someone else to be responsible for it.

How can an entirely dependent creature attempt open revolt? He dare not, so he must not only find suitable objects to project his guilt on, but must also modify his behaviour in some respects, and compromise. If, for instance, particularly great pressure is brought to bear on him with regard to cleanliness, he may become constipated—still apt to dirty himself, but only infrequently. Thus he submits to one prohibition while at the same time trying out partial revolt.

Muscular actions require many repetitions before they become reflex and effortless; and in the child's mental life there are many attempts and repetitions before responses are established which finally become automatic, and almost ineradicable. The great danger of mental responses is that, having once become established, they are repeated unconsciously and cannot later be changed merely as a result of critical assessment. Having worked out a faulty adjustment—for instance, great repression and fear of authority—the individual is likely to be hampered for all his life by an excessive response of fear to a situation which does not warrant it. He invests his parents with tremendous power, which they do not really possess; how much less is the power of people with whom he associates later, on whom his dependence is largely imaginary. The fact that so much of our mental life becomes reflex, automatic, unconscious, at this early age makes these early years vital.

Two outstanding emotions of the first two years are jealousy, and the œdipus complex. The existence of the first is often denied, and the second has met with greater resistance than any other of the analytical theories.

Jealousy is a felt threat of loss of love—love which seems at the time essential. The infant survives solely by love. If we allow him enough feeling to know that he needs this love, and accept that he has imagination, we can deduce that many things will appear to threaten this love. The father will at times seem to monopolise his mother's love; the arrival of another sibling must appear to him as great deprivation. He has strong instinctive drives, designed to serve his own survival, and they must all be stirred in situations where he feels threatened or deprived. Since any expression of his jealousy is most unlikely to meet with approval, he has the choice of regressing to an earlier stage (when he could command love through his physical needs), or of becoming a nuisance in other ways, or of inverting his feelings of jealousy and showing excessive concern for this rival's welfare. In all of these expressions there is a compromise between what he wants to do, but dare not for fear of reprisals, and what he finally does as the only way out of a thorny dilemma. What he cannot do, being human, is to be indifferent.

Infantile sexuality, if seen as an overriding demand for love, feeds at this stage on fantasy. He has, as yet, no knowledge of how love operates, he does not differentiate the zones for the reception of satisfaction. His fingers are as capable of giving him satisfaction as any other part of his body; his mouth is particularly satisfying for feeling, touching, tasting. He is aware of his own bodily needs and invests his voice, his excreta, his genital organ with magical qualities; and it is in this *magical* sense that he also wishes for complete fulfilment. Differentiation between physical and spiritual love is impossible till much later; and though he may demand for himself all he can see, he is satisfied with very much less. We all know that the infant or young child who masturbates does so to allay his own fears; and if these have been roused in connection with his infantile sexual fantasies, he will, nevertheless carry the fear with him to the time when he may fulfil himself as an adult.

The crucial task at this stage is how to leave the child with enough instinctual drive to make him a happy, rational, confident adult and how to civilise him sufficiently for life as a social being. His instincts must be moderately satisfied if they are to serve him as an adult; suppressed, unfulfilled demands in infancy, when his powers of dealing with them are wholly inadequate, prevent him from acquiring a rational attitude to them later. It seems there is an optimum time for acquiring mental attitudes, just as much as there is for learning to walk. Throughout this period compromises made through love leave a good, healthy, happy feeling, whereas compromises made through fear produce feelings which are unhappy, distorted, and dissatisfying.

### FROM TWO TO FIVE

The years from 2 to 5 are years of consolidation and the learning of new skills. Expansion in the mental sphere includes increase of consciousness, the use of reason and a degree of social adjustment. The character structure daily becomes better established and the child's defences are organised. By now predominant traits can be seen, and types of difficulties are recognisable. Feeding and sleeping difficulties often go together

and can be traced backwards in the history. Some use food and feeding as a major compensation for restricted outlets in other directions; others are ready to attack the world and seem to stand in need of repeated proof of their prowess. These have as little real security as those who timorously withdraw.

From now on the child is not so plastic as he was; for he has his own ideas, expectations, hopes, and fears and will use his experience selectively to strengthen some and weaken other aspects of his personality. His approach is no longer wholly unbiased or inexperienced: instead of meeting the world with fantasy alone, he now has some experience of reality, and does not apply fantasy so readily to the outside world.

If one doubts the existence of fantasy in children one need only think of the vivid, cruel, imaginative fairy-tales which have survived through the ages only because they appeal to something vital in the child.

### THE MOTHER

Emotional development of the child would be unimaginable without the presence of the person who loves and cares for him, and on whom his survival depends. The importance of the rest of the family, though no less great, is at first indirect.

Freud thought that mother-love was perhaps the only love which contained no envy, jealousy, mistrust, resentment, or other negative feeling. No doubt it is the most unselfish emotion experienced by humans, but, like other kinds of love, it is a continuation of earlier experiences. The mother intends with all her might to love the baby, and think only of his welfare; but, as a human being, she has her hopes, fears, disappointments, and expectations. She is undergoing her most intense emotional experience and this rouses earlier associations and renews their vigour. She cannot separate her earlier personality from her present one: on the contrary, she will derive her strength and weakness from her earlier experiences.

There is thus a duality, at least, in the mother, between her conscious wishes and her unconscious established attitudes. If these incline her to uncertainty and lack of confidence, she will handle the baby in a way which makes the baby feel anxious and uncertain. If she accepts the baby on the condition that he conforms to her idea of a perfect baby, she will inevitably reject him when his behaviour is opposed to her ideas. Often she has an exalted idea of the good mother, and entertains some doubt about herself in this rôle. The most effective confirmation of her goodness is given her by the baby: if he thrives and does what is expected of him, she can feel reassured. Should the child respond more to the doubt, than to the warmth and love she offers, this is an equally strong condemnation which she finds very difficult to bear. In this situation outside criticism, or what she takes for criticism, also reinforces her own doubts. Should her own doubts and disturbance become severe, she will require repeated reassurance and understanding before she can relax sufficiently to see the situation at all objectively.

Most mothers see their babies, at first at any rate, as an extension of themselves. Physical separation at the birth of the child does not automatically enable them to recognise him as another individual with similar and dissimilar desires to those they themselves possess.

Rigid rules are of very little help in this complex, mutually growing dynamic relationship. The mother needs sympathy and understanding, just as the infant does; and most important of all, she must feel herself to be good if the infant is to feel her so.

### CONCLUSION

Babies and infants are believed to possess imagination long before they possess physical strength. This imagination makes them feel and respond to outside events in ways far beyond the real significance of these events. Their imagination also provides them with ideas of omnipotent goodness, and of complete destructiveness. They interpret events as stemming from these powerful ideas within. When their hostile and destructive impulses are met with understanding and sympathy they willingly modify them, and in the process gain feelings of goodness and power. When these same impulses have to be modified under pressure or demand, or threat of rejection, they find other, tortuous, outlets and plunge the child into internal struggles before he is ready. They also diminish his available energy for meeting the outside world, and distort his picture of what is real and what imaginary. The greater the child's preoccupation with his inner life, the more will this unreal imaginary world invade reality.

The mother's earlier experiences are thought to influence her behaviour to the infant. If her fears and resentments are brought to light, understood, and accepted she can deal with it. As she is usually unaware of it herself the doctor's rôle is important.

In mental development there is as much flexibility and as definite a tendency towards improvement as in physical development. Moreover, even in the child, good acceptable unselfish conduct produces contentment and integration, whereas bad antisocial conduct gives satisfaction only for the moment.

Our whole history has been a war of opposed tendencies. Had we less desire for social and individual improvement, we might never have progressed so far. Had we fewer and less powerful primitive drives, we might not have survived.

I should like to acknowledge my gratitude to Dr. J. J. M. Jacobs and Dr. Emanuel Miller of St. George's Hospital, to Dr. J. A. Scott of the London County Council, and to the Tavistock Clinic.

## RENAL DISEASE

A SYMPOSIUM on Modern Aspects of Renal Disease was held at the Postgraduate Medical School of London on Sept. 26–30.

Prof. CLIFFORD WILSON gave a valuable preliminary account of present views of the classification of renal disease. In a discussion of the nephrotic syndrome, Prof. J. SQUIRE stressed the importance of urinary protein loss in the causation of hypoalbuminæmia and œdema. Dr. R. LIGHTWOOD stated that the present tendency in the use of corticotrophin or cortisone was to continue treatment for a considerable time after diuresis had occurred, and, if possible, until a normal plasma protein pattern had been restored.

The pathology of renal disease was explained with admirable clarity to an audience composed chiefly of physicians rather than morbid anatomists. Prof. J. H. DIBLE dealt with acute renal tubular necrosis, and Prof. C. V. HARRISON with renal amyloidosis and nephrocalcinosis. Dr. P. KINCAID-SMITH, in a demonstration of the pathological changes in malignant hypertension and chronic pyelonephritis, confirmed recent views of the importance of nephritis in the ætiology of severe hypertension in patients under the age of thirty. Two comparatively recent specialised pathological techniques proved of special interest. Dr. E. M. DARMADY described how microdissection of individual nephrons had advanced knowledge of the localisation of renal tubular disease; and Dr. R. C. MUEHRCKE (Chicago) told of his experience of over 350 renal biopsies by percutaneous needle puncture, using slides from cases of the nephrotic syndrome and acute disseminated lupus erythematosus to demonstrate the value of this method.

The relationship between renal disease and hypertension was considered in detail. Prof. J. MCMICHAEL reported favourably on the use of ganglion-blocking drugs in hypertension associated with mild uræmia; but he considered that benefit was unlikely in patients in whom the blood-urea was consistently above 100–110 mg. per 100 ml. It was agreed that a unilateral renal lesion was a rare cause of severe hypertension

in man, but was of great importance in view of the possibility of complete cure by nephrectomy. Mr. R. SHACKMAN thought that detailed investigation of the separate function of both kidneys by inulin and *p*-aminohippurate clearances was essential in accurate preoperative assessment.

Dr. K. G. LOWE described the principles of conservative management of acute renal failure; and Prof. J. HAMBURGER (Paris) discussed treatment by the ancillary methods of exsanguino-transfusion, peritoneal dialysis, intestinal perfusion, and the artificial kidney. He considered that the last method was by far the most efficient, and, in its present perfected state, was a major therapeutic advance. Dr. E. G. L. BYWATERS gave an account of the development of knowledge of the causation and treatment of acute renal failure in air-raid victims during the second world war. Prof. M. L. ROSENHEIM discussed the treatment of chronic uræmia, and emphasised the value of control of diet and fluid intake, and correction of electrolyte abnormalities, anæmia, and urinary infection.

Prof. R. A. MCCANCE, in a description of renal function in infancy, stressed the especial dangers of overhydration at this age. Dr. LIGHTWOOD discussed the two important conditions of infantile renal tubular acidosis and idiopathic infantile hypercalcæmia. The former was thought to be becoming less common in the last few years. Excess intake of vitamin D could not be excluded as the cause of hypercalcæmia, since this condition occurs only in artificially fed infants, and all dried milk and proprietary cereal foods appeared to contain added calciferol. Renal osteodystrophy was well described by Dr. C. E. DENT, who dealt with specific renal tubular syndromes, and by Dr. S. W. STANBURY, who stressed the bewildering diversity of the bone changes that can occur in association with chronic uræmia.

Dr. R. SOUGIN-MIBASHAN (Cape Town) gave an account of 150 cases of gout seen in South Africa; and there was evidence that renal abnormalities were present in 40% of gouty patients. In a discussion of diuretics, Dr. R. I. S. BAYLISS dealt with mercurials and Dr. M. D. MILNE with acetazoleamide ('Diamox'). It was agreed that the latter drug was more useful as an adjuvant to mercurials, rather than as a diuretic in its own right. Modern views of electrolyte metabolism were admirably summarised by Professor MCCANCE, Dr. D. A. K. BLACK, and Dr. P. FOURMAN. The final two sessions were concerned with the relationships of the endocrine glands and the kidneys. Dr. C. L. COPE discussed the effects of the adrenal cortex and Dr. O. GARROD, the posterior pituitary gland. They described practical methods for the diagnosis of deficient adrenal function and of diabetes insipidus, not requiring elaborate laboratory assistance.

## THE WELLCOME TRUST

THE Wellcome Trust came into being in 1936 under the terms of Sir Henry Wellcome's will. Twelve years earlier, Wellcome had formed into one organisation his original business of Burroughs Wellcome & Co., London, its various overseas branches and subsidiary companies, and the research laboratories, museums, and the library of the history of medicine which he had founded. He combined all these into one limited-liability company, which he called the Wellcome Foundation Ltd. Originally the Foundation had a theoretical capital of one million £1 shares, and in 1936 these passed to a board of five trustees appointed by Wellcome's will. Their chief duty was the proper expenditure of the Trust's income to support researches in medicine and allied sciences, which were very broadly defined, and to create, endow, or support research museums and libraries dealing with medicine and its history anywhere in the world.

Wellcome thus created two related but partly independent organisations and gave them titles that could hardly fail to lead to confusion between the two. Indeed, at an at home given by the Trust on Oct. 5, Sir Henry Dale, O.M., F.R.S., its chairman since 1936, referred ruefully to the large number of letters he received that should really have gone to the Foundation. The Foundation, Sir Henry emphasised, was the world-wide business and the laboratories, museums, and library associated with it; the Trust were the holders of the whole share capital of the Foundation and were responsible for seeing that the income was used according to the will's instructions.

For the first five years of the Trust's existence all its resources were absorbed in paying the very heavy death duties on the Wellcome estate; and by the time they were paid the country was at war. For the trustees, as shareholders, the abnormal situation continued for some years after the war, and under the circumstances, Sir Henry said, their policy had to be an opportunist one. So far, they had only occasionally taken the initiative by themselves proposing a particular benefaction; more often they had responded to requests for help. But under the more normal conditions that now prevailed they should be able to count on substantial resources being regularly at their disposal; and the time had come, Sir Henry said, for a longer-term policy and more coördinated planning by the trustees. And that meant they would need a whole-time administrative staff to deal with the charitable aspect of their functions. Dr. F. H. K. Green, formerly principal medical officer on the headquarters' staff of the Medical Research Council, had lately become scientific secretary to the Trust, and he would take chief responsibility for the executive organisation of the Trust's spending policy. There was also to be a change among the trustees: Prof. T. R. Elliott, F.R.S., was about to retire, and he would be succeeded on Jan. 1 by Brigadier J. S. K. Boyd, F.R.S., who was leaving his post as director of the Wellcome Laboratories of Tropical Medicine. Among some specific prospects in view, Sir Henry mentioned a wider system of travel awards for senior men; and he also spoke of plans for a department of research in anæsthesia at a university to be announced presently.

## MEDICAL PROTECTION SOCIETY

ALTERATION of the periods within which legal actions may be brought were mentioned by Sir ERNEST ROCK CARLING, presiding over the annual general meeting held in London on Oct. 5. The Law Reform (Limitation of Actions, &c.) Act, 1954, increases from one to three years the period during which a plaintiff seeking damages for personal injury must commence legal proceedings against a public authority (which includes hospitals and members of their staff); but it reduces from six to three years the corresponding period for actions against private practitioners. By enlarging the jurisdiction of county courts and increasing the amount of damages obtainable in them (from £200 to £400 or even £500) the new County Courts Act may increase litigation against the profession, especially as legal aid is likely to cover county-court proceedings.

Turning to avoidable causes of litigation, Sir Ernest spoke first of the skin-tight plaster, which must always be watched with great care: if any doubt whatever is aroused by continuing pain or by a change of colour in the extremities the plaster must be removed or at least completely split. On the vexed question of swabs left behind at operation, he expressed the view that when a surgeon has made a search for a swab, *secundum artem*, he is then entitled to rely upon that part of the hospital organisation to which he appeals by asking the theatre sister "Is the count correct?"

It is, Sir Ernest believes, very wrong for any doctor, speaking from a position of comparative safety, to criticise the previous action of a colleague working under stress of circumstances and with a full sense of responsibility; and the critic who hands that colleague over to the mercies of the Law thereby demonstrates his own deficiency in appreciating the human relationships which

are of the essence of good doctoring. Nobody can be sure of always avoiding mistakes, and in paying a subscription to a defence society every member can be regarded as pouring out a libation to the gods, praying that fate may not lead him into error.

Mr. W. G. HAWKINS, of Messrs. Le Brasseur & Oakley, solicitors to the society, spoke of the pressure and strain of conditions under which professional men now live and work. None of them can say that they have all the time they want for their work; and in consequence they must often find a quick solution for their problems. Nearly always they are right, and it is a pity that they should be stigmatised for the rare error. But unfortunately it may be impossible, in a court of law, to explain the nature of the conditions under which the work has been done; for to say, for example, that the doctor was in a hurry is to damage his defence by admitting a degree of failure.

The society's annual report shows that during 1954 the number of new cases in which members sought its help rose to 2180. The membership continues to increase and at the end of the year was over 29,000. With the annual subscription at £2, rather more than £7000 was carried to accumulated funds, and the society's financial resources stood at £179,000, besides which it is reinsured for a considerable sum. Despite the rise in legal expenses and costs and damages, the council is satisfied that with these reserves there is no need at present to ask members for an increased contribution in order to secure the unlimited indemnity granted them for the protection and defence of their professional interests.

Sir Ernest Rock Carling was re-elected president, Mr. W. M. Mollison treasurer, and Dr. Alistair French secretary. The chairman of council is Dr. F. Harwood Stevenson.

## Public Health

### Sweet-wrapping in Private Houses

THE true incidence of food-poisoning in this country is not known. The disease is notifiable under the Food and Drugs Act, 1938, but it was the scheme for reporting, introduced in 1949, that provided more accurate information about outbreaks and sporadic cases. Despite this improvement, details are still far from complete. More and more attention is being given to food-borne infections, however, and since the war preventive measures have been intensified. Increasing efforts have been made to get the public to realise their responsibilities in preventing food contamination. The staff of the public-health department make a careful search for the source of infection in every notified case—but with limited success. Food campaigns have been launched, directed particularly at manufacturers and retailers. The emphasis has been on cleanliness in the handling of food, but the real aim should be to handle it as little as possible or not at all.

It has been said that the efforts of medical officers of health and others to educate food handlers and the general public in their responsibilities in the production of safe meals have not been very successful so far.[1] This may be true to a considerable extent, but there is evidence that many firms, especially the big ones, are now coöperating more closely than formerly. Perhaps, also, public awareness in these matters is increasing; and for this the health visitor must be given a good share of the credit. This is the crux of the problem, for it is the public demand for clean food that will give the retailer the best stimulus to provide it.

Food prepared or wrapped by outworkers in their own homes runs a very considerable risk of contamination. The Factories Acts require contractors to tell the district council what workers are engaged in specified classes of work at home. The manufacture of chocolates and sweetmeats is included in the list, but the packing or wrapping of foodstuffs is not. The wrapping of large quantities of children's sweets in private houses in South London has recently been brought to notice.[2] The sweets are bubble-gum and candy cigarettes and matches. They are packed in kitchens and back parlours, and it is clear that the chances of their becoming infected are great. Standards of cleanliness for rooms in which food intended for human consumption is "prepared for sale," and for those engaged in the preparation, are laid down in the Food and Drugs Act. Wrapping of sweets is excluded from these provisions, but the model by-laws[3] refer to every person who handles, wraps, or delivers any food. Chewing-gum, also, is not a "food" for the purposes of this Act. The medical officer of health would therefore have no knowledge of these workers; and what is going on in South London may well be happening elsewhere.

A first essential is to include "wrapping and packing of foodstuffs" in the prescribed form of lists of outworkers which are open to H.M. Inspectors of Factories and officers of the district council. We understand that chewing-gum (which presumably includes the popular bubble-gum) is to be classified as a food in the Food Hygiene Regulations being made under the new Food and Drugs (Amendment) Act. These changes will help the medical officer of health to find out something about the extent of this unhygienic practice, and to take steps to stop it.

Meanwhile, the coöperation of those sweet manufacturers who, despite press publicity, continue to allow their wares to be wrapped in this way, should be sought. They should insist on reasonable standards of cleanliness in their employees. The contractor whose wares were referred to in the *Sunday Pictorial* has now, we gather, given up all home wrapping. This result illustrates the value of such publicity in a clean-food campaign.

### Losses of Young Life

Loss of life is still heavy in embryonic and perinatal life, particularly in countries which are economically poor and socially backward. The Population Division of the Department of Social Affairs of the United Nations has made the first detailed comparative study of the different aspects of the problem in many different countries,[4] and its valuable work should pave the way for more accurate international standardisation of definitions and their stricter enforcement. More reliable data would aid investigation of the factors responsible for early wastage of life. The task is formidable, especially in the more backward countries; for the provision of accurate national statistics depends, of course, far more on family doctors and other field workers than on the relatively small group of statisticians who analyse and interpret the facts presented to them.

In a monograph from the Institute of Preventive Medicine, Netherlands Department of Health, van Gelderen[5] focuses attention on mortality in the preschool child. He contends that the mortality-rate of children between one and four years of age is probably a better yardstick of social and hygienic conditions than the infant-mortality rate.

In the Netherlands mortality in that age-group has declined more than tenfold in the past fifty years, but it remains considerably higher than the mortality in children of school age. In the preschool group, mortality varies inversely with age, but the gradient is tending to flatten out, because the decline of deaths from all causes is not accompanied by a decline from accidents, which are commoner in the older children. van Gelderen believes that the small size of families, and good child care, which tend to be complementary, are now more important than intensive medical care as causes of low mortality in the preschool child. The higher mortality at preschool age in Holland than in other advanced countries is chiefly due to a rather high mortality from accidents and common infectious diseases, notably

1. Report of the Ministry of Health for 1952. Part II. H.M. Stationery Office.

2. *Sunday Pictorial*, July 31, 1955.

3. Series 1, 1949. Issued by the Ministry of Food.

4. Fœtal, Infant and Early Childhood Mortality. Vol. 1: The Statistics. Pp. 137. 11s. Vol. 2: Biological, Social and Economic Factors. Pp. 44. 3s. Department of Social Affairs (Population Division), United Nations, New York. H.M. Stationery Office. 1955.

5. Pre-School Child Mortality in the Netherlands. By H. H. VAN GELDEREN, M.D. Leyden: H. E. Stenfert Kroese, N.U. 1955. Pp. 138.

diphtheria. In this age-group the number of deaths from accidents is the same as that for the common infectious diseases and respiratory infections combined: drowning causes as many as 40% (doubtless because of the nature of the country), traffic accidents 30%, and burns 10%, and the accident death-rate is twice as great in the country as in the towns. van Gelderen showed that the most important single factor in the prevention of accidents in the young child is a high standard of maternal care, and he regards systematic instruction of mothers in accident prevention as very important.

### Poliomyelitis

Notifications of poliomyelitis in England and Wales in the week ended Oct. 1 (39th week) showed little change from the preceding week. The figures were (38th week in parentheses): paralytic 207 (201), non-paralytic 180 (193), total 387 (394). Regionally the figures decreased in the North Midland, London and South-Eastern (including Greater London), and South-Western regions and in Wales. There were slight increases in the East and West Ridings and in the Northern, North-Western, Midland, Eastern, and Southern regions. In Greater London, Willesden notified a further 11 cases and Harrow 4. The following figures give the total uncorrected notifications in the 39th week during the past six years (percentage of paralytic cases in parentheses): 1950, 332 (66·9%); 1951, 108 (59·2%); 1952, 162 (64·2%); 1953, 157 (50·3%); 1954, 70 (57·1%); and 387 (53·5%). Although the proportion of non-paralytic cases dropped further to more normal proportions, there were still 12 counties in which non-paralytic cases exceeded or equalled paralytic ones. This excess was particularly striking in Middlesex, Essex, and Surrey. In 1955 so far the proportion of non-paralytic cases has been approximately 46·1% of the total. The corresponding figures in the preceding four years were: 1951, 41·5%; 1952, 29·8%; 1953, 34·6%; 1954, 32·8%.

It is reported from the United States [1] that the poliomyelitis-rate among children aged 5 to 9 who had had vaccine was 25–50% lower than among those not vaccinated. Preliminary findings are described as "very encouraging."

### Well-water Cyanosis

In this country cyanosis in infancy due to nitrate contamination of well-water is uncommon; but in 1951 Ewing and Mayon-White [2] reported from Suffolk three cases (one fatal) associated with a high nitrate content of water from shallow, insufficiently lined wells, used to make up artificial feeds.

Well-water cyanosis, which is limited to the first few weeks of life, is due to the conversion of nitrates to nitrites by coliform bacteria in the intestine. The nitrites enter the bloodstream and convert hæmoglobin to methæmoglobin, which is too stable for transport of oxygen, and reduces the oxygen-carrying power of the blood. Taylor [3] suggested that 20 parts of nitrates per million should be regarded as the highest acceptable figure in water used for preparing an infant's milk mixture.

Dr. A. C. Gee, in his report for 1954 as medical officer of health for Lothingland, Suffolk, remarks that in that area a case of well-water cyanosis was detected about the same time as those recorded by Ewing and Mayon-White; and he describes a scheme for ensuring the safety of the water used in artificial feeding. By this scheme, which has now been in operation for some two years, district midwives inform the health department of coming confinements and report on the source of the water-supply. If this is a well, samples are taken for analysis; and when analysis indicates that the water is likely to be dangerous, an alternative supply is provided if artificial feeding becomes necessary. But, Dr. Gee adds, the scheme is proving difficult to administer, since not all mothers come under the care of the midwives. He suggests that doctors and hospitals serving rural areas should bear in mind the potential dangers of well-water and that, where necessary, the local health authority should be asked to analyse the water-supply in the home.

1. *New York Times*, Oct. 2, 1955.
2. Ewing, M. C., Mayon-White, R. M. *Lancet*, 1951, i, 931.
3. Taylor, E. W. The Examination of Water and Water Supplies. London, 1949.

### Western European Union

The Public Health Committee of the Western European Union met in London on Oct. 4–7. The meeting was attended by delegates of the five Brussels Treaty countries (Belgium, France, Luxembourg, the Netherlands, and the United Kingdom) and of two new member-countries — Italy and the Federal German Republic.

The committee decided to make a preliminary study of air pollution in the seven countries. It also decided to extend to Italy and the Federal German Republic the arrangements by which no health control is imposed on an aeroplane or ship between member-countries.

The next meeting of the committee will be held in Paris next April.

### Statistics for England and Wales

The Registrar-General's return for the June quarter of this year appeared last week.[1] The principal births and deaths figures were published in an earlier weekly return.[2] Provisional figures of causes of death in the March quarter of 1955 show that measles caused 58 deaths—8 more than for the whole of 1954, which had a record low figure of 50 deaths. The figure for the March quarters of 1954 and 1953 (the last epidemic year) were 15 and 142 respectively. There were only 2 deaths from diphtheria. A sharp rise in the number of deaths from poisoning by domestic gases brought the number of deaths from all forms of accidental poisoning to 459. The figures for the preceding three quarters were 278, 168, and 243. There was also an increase in the total number of deaths from falls, but while those of women numbered 1030 compared with 971 in the March quarter of 1954, those of men numbered 601, compared with 646.

## Medicine and the Law

### Tuberculosis: Compulsory Removal to Hospital

THE magistrates at Haverfordwest have ordered the removal to hospital of a man suffering from tuberculosis of the respiratory tract. The case was said to be the first of its kind in Pembrokeshire.[3]

The case concerned a 40-year-old married man with four children. He was a casual labourer and had not worked for some time. In July he was admitted to hospital but discharged himself against medical advice a few weeks later. He returned home and stayed there with his wife; his children had been removed because of his infectious condition. He had been using public transport and mixed with other people although he was a source of infection. He had refused to return to hospital despite pressure by his own doctor, the district nurse, the county medical officer, the assistant chest physician, and the chest-clinic sister.

On the application of the Pembrokeshire County Council under section 172 of the Public Health Act, 1936, the magistrates ordered his removal to hospital for three months. This is the maximum period of detention allowed by the section, but the county council can apply for a renewal of the order.

Section 172 applies only to cases of tuberculosis of the respiratory tract. The application must be made either by the county council or by the local authority, who must show: (*a*) that the patient's circumstances are such that proper precautions to prevent the spread of infection cannot be taken, or that such precautions are not being taken; (*b*) that serious risk of infection is thereby caused to other persons; (*c*) that accommodation is available for the patient in a suitable hospital or institution.

1. The Registrar-General's quarterly return no. 426. H.M. Stationery Office. Pp. 24. 1*s.* 6*d.*
2. See *Lancet*, July 30, 1955, p. 244.
3. *Pembroke County Guardian*, Sept. 16, 1955.

# In England Now

*A Running Commentary by Peripatetic Correspondents*

As usual at the beginning of the university year, the narrowing effect of the science courses has been condemned or regretted and many solutions offered. But before accepting these would it not be wiser to decide what actually is a "narrow outlook" and what is the object of widening it? With the ever-increasing quantity of knowledge is it better to know a little about a lot or a lot about a little? Is it really true that all those who possess an arts degree are more broadly educated than those with a science degree? Does not the personality and ambition of the student play a part? A man who is going up to the university to complete his education and is still undecided about his future is surely more likely to obtain a wider experience than a man who is studying to fulfil his ambition to be a doctor. Is it so wrong that the medical student should read medicine to the exclusion of other subjects, which he feels he can study later, perhaps during his period of National Service? Is it indeed possible for any except the most gifted to cope adequately with extra subjects? To add subjects, such as a superficial knowledge of ancient languages, for their supposed cinemascopic effect, is needless. With the correct emphasis placed appropriately within the present syllabus by teachers of wide learning, there is no need for additional subjects.

A lecturer can by example encourage students to see knowledge everywhere, to read Shakespeare to learn life, to read novels to study the interplay of personalities and their effect on events. The object of widening the student's outlook is to enable him to distinguish a real argument from a false one, to make correct deductions from sound evidence, and to be tolerant and liberal. The logical and analytical methodology can be taught through medical statistics and physiological experiment, while tolerance can be taught through psychology. These attributes can be developed by group discussions which by introducing other peoples' views further help the broadening process. Another step in the same direction is to include people other than medical students in some of the discussions, and to exclude authoritarian teachers. Once qualified the medical student's pure pursuit of arts and classics will only be hindered by earning a living, keeping up with recent advances and reading the journals, washing up, tidying the garden, and even painting the house. Can it be true that a nodding acquaintance with Greek mythology can shorten the syllabus, run the practice, and abolish the household chores?

* * *

So you read that article in the Education number on practice in Canada and you decided that you would come over, did you? You said to yourself "I can easily qualify again after a couple of evenings' revision, and after all I don't have to learn a new language." But, as we say over here, "you do too" (or "you do *so*"). Mind you, some of the North American words are an improvement—such as thumb-tack for drawing-pin—but I still prefer lift to elevator. It is easier to understand, I find, than to be understood, because the newcomer is expecting a new sound, whereas the natives are not. It is especially noticeable on the telephone, where operators hear numbers half unconsciously. I have given up trying to be understood when I say "two two oh oh" now I say twenty-two hundred.

I found myself saying *cig*arette and *mag*azine within a few hours, but it took longer to remember that ice here means ice and not ice-cream. You get ice-cream, too, if you ask for pie à la mode, or even pie à la. A letter-box is a mail-box, a kirby grip is a bobby pin (not that I buy many), and press-studs are dome-fasteners. My pants have cuffs, though I had turn-ups on my trousers at home. In the garage the boot is the trunk, and the hood is the bonnet, and goodness knows what they call the hood.

The newspapers leave out the subject of the sentence in the headlines—"Says Police Bribed, Charges Corruption." It gets worse when they leave out the comma as well. I saw one last week—"Assaulted Man Gets Three Years"—which seemed downright unfair.

When I go up in a lift I keep having to walk downstairs again because most of the buildings start numbering their floors from the ground (which is the first). This hospital prefers the British system, but then I forget that and so have to walk *up* a flight. The other day I thought I'd play safe and ask for "the top." Even that was wrong. The liftman looked at me coldly. "Do you mean the taap?" he asked. I apologised humbly and said "Yes, I mean the taap." Then he said "Gor blimey—yer can't understand a fing they say in this b——country, can yer?" He came from Catford. I nearly kissed him.

* * *

What will advertisers do next? On Oct. 1 I received by post, and in the same envelope, two smaller sealed envelopes, one marked "Open immediately on Oct. 1," the other "Do NOT open until Oct. 3." I opened the former and found seven little bits of paste-board, each of which bore a different letter of the alphabet. An accompanying letter told me that, correctly arranged, these spelt the name of a new product to be marketed, and that the name was revealed in the second envelope. I began to play about with the cards and soon got SELCOAT, which I imagined might be some form of salt-coated tablet. Not much taken with this idea I tried another combination and got ELASTOC—obviously a surgical elastic stocking. Next came SCOT ALE, OCSTALE (soup), and A CLOSET, which may be regarded as non-runners. A few minutes later I spelt LACTOSE. Surely that was right. Hastily I opened the second envelope (without waiting for Oct. 3) and found that even this was wrong, the correct answer being TO—— but I mustn't give them a free advertisement.

* * *

The whole family came along to outpatients—father, mother, and two girls aged 6 and 9. The complaint was that the girls couldn't sleep at night. They refused to go to bed until their parents did, insisted on the door between the children's and parents' bedrooms being left open all night, and had reduced mother and father to near hysteria. The suffering parents had obviously read some books on child psychology warning them of the dangers of repressing their children; I wish the author could have seen them.

I tried to point out that children need parents who are not afraid to tell them when to stop; that no child can cope with the idea that it is all-powerful, or the thought that no-one can restrain its most arrogant demands, &c., &c. Everyone departed looking thoughtful. I think the idea must have caught on because mother came back next week to report that the results of treatment had been dramatic. That same evening an enraged father had gone into the children's room and told them to go to sleep at once on pain of a sound thrashing, and had left the room slamming the communicating door. Both children had promptly fallen fast asleep while father lay awake all night with a violent headache.

* * *

In a doctor's house even the cats should be familiar with sanitation. We have a kitten whom we are trying to house-train. In common with other cats he had tried using the sink, the wash-basin, and the bath. Today he decided to try a new receptable and a familiar "tinkle-tinkle" made me look round to see him sitting on my small daughter's pot, with his tail carefully spread out behind.

* * *

She was a fine modern example of her kind. Sleek and beautiful she stood, with a shine on her the envy of all who beheld her. She was equipped with every accessory one could wish for. One felt that somewhere tucked away inside there must even be a television set. Nothing for the comfort of her passengers was omitted. There was even a delicate trailing chain from her nether regions.

* * *

Last year, after an evening spent in surveying mortgage payments, bank overdraft, hire-purchase agreements, debts to relatives, and unpaid bills, I was disturbed by the entrance of my Wolf Cub son bearing aloft a trophy. "I won the King Conker competition," said he. I replied absently that I didn't know he had any conkers that year; I suppose I might have guessed he would say, "I hadn't. I borrowed one."

# Letters to the Editor

## ASTHMA, CHRONIC BRONCHITIS, AND EMPHYSEMA

SIR,—Dr. Lister's welcome article last week has important epidemiological implications. If it is true of the fair city of Plymouth, how much more unfortunate is the lot of the asthmatic and chronic bronchitic in our industrial towns with their persistent smoky haze and their occasional smog. These patients suffer greatly in winter—many are unable to work, and many are sent to hospitals where they block beds which are needed for others. The problem is serious to all concerned; the patient, his family, his employer, his physician—and the nation.

I would like to see a simple type of accommodation, linked to the hospital service, fitted with air-conditioning, where chronic bronchitics could spend part of the winter instead of taking up much-needed hospital beds or having expensive convalescent treatment, as is often recommended, in a favourable climate either in the south country or abroad. It is noticeable how quickly these patients improve when they breathe clean air. During a winter smog, I have advised patients to leave their cheerless rooms, put on a smog mask and go to an air-conditioned cinema (where there is a continuous performance!) and there breathe clean, warm, and dry air. Once the patient breathes air free from filth and fumes a remarkable improvement takes place in his condition.

Alternatively, I do not see why there could not be an extension of Remploy workrooms with air-conditioning, in large centres of population, where these patients could attend and have interesting and useful work instead of enforced idleness.

During the deliberations of the Beaver Committee, I was often surprised to learn from unchallengeable sources the enormous extent of air pollution by noxious gases and particulate matter in this country. To take one example, there are 5¼ million tons of sulphur dioxide poured into the air every year. The main source of this pollution takes place in what we called "black areas" where 24 million of our people live, and where asthma and chronic bronchitis is not only a severe but a frequent condition.

It is to be hoped that as part of a preventive programme against chronic chest disease the profession will lend its influence in the reduction of air pollution by all means in our power; by declaring in clear terms that *safe* as well as clean air should be our national policy, and that smoke, smaze, and polluted air must go.

Health Department,
Salford, 5. J. L. BURN.

SIR,—Dr. Lister is to be congratulated on his most stimulating and thought-provoking paper. In fact anything which excites stimuli or provokes thoughts on the nationally important subject of chronic bronchitis is to be welcomed in an attempt to clarify some of the confusion which shrouds this common state.

As I see it, Dr. Lister's thesis is that these conditions are closely related and are indeed "an integrated sequence of pathological change" having a uniform and common underlying cause—namely, "an allergic constitution" with an inherent and hereditary weakness of the respiratory tract, both in its upper and lower levels. Evidence of this weakness is already apparent in childhood as in the catarrhal and chesty children; according to Dr. Lister, it seems to be but a step from this catarrhal stage to the chronic bronchitic of later adult life.

If we accept these reasonable views as correct then we may at once have a possible method of preventing chronic bronchitis, by picking out these catarrhal children in our community, where they are indeed so common both in general practice and in the E.N.T. and pædiatric departments of our hospitals, and seeing to it that they avoid any of the possible stimuli which may cause irritation of their lower respiratory tracts with eventual development of chronic bronchitis.

Unfortunately the views propounded do not exactly fit certain of the known clinical facts concerning infections of the upper respiratory tract in children and chronic bronchitis in adults, and we must seek answers to the following queries before we can accept the allergic constitutional ætiology without reservations.

Upper respiratory infections in general practice (whence I come) are relatively most frequent in children of preschool and early school years. If these conditions are observed, however, it is most interesting to note that in a great majority of cases the common nasal catarrhs and chronic coughs undergo a spontaneous natural remission around the age of 7–9 years. This is well illustrated in table I. The incidence of affections of

TABLE I—UPPER RESPIRATORY INFECTIONS IN GENERAL PRACTICE

| Age | 0–4 | 5–9 | 10–19 | 20–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70 + |
|---|---|---|---|---|---|---|---|---|---|
| Attendance rate per 1000 at risk .. .. | 1000 | 1000 | 500 | 400 | 350 | 300 | 275 | 250 | 225 |

TABLE II—LOWER RESPIRATORY INFECTIONS IN GENERAL PRACTICE

| Age | 0–4 | 5–9 | 10–19 | 20–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70 + |
|---|---|---|---|---|---|---|---|---|---|
| Attendance rate per 1000 at risk .. .. | 250 | 450 | 200 | 175 | 200 | 220 | 400 | 700 | 950 |

the lower respiratory tract, including acute and chronic bronchitis, asthma, and pneumonias, shows a different pattern in general practice, rising with age, as seen in table II. It is somewhat difficult, therefore, to correlate the view that the catarrhal chesty child is the forerunner of the elderly chronic bronchitic with these findings—for why should there be this natural remission in upper-tract infections at 7–9, and why should the condition recur as chronic bronchitis after a latent interval of many years?

It is, I believe, generally agreed that chronic bronchitis is largely a disease of men, whereas the incidence of chronic nasal catarrh in children and adults is equally distributed in the two sexes: why should an allergic constitution be so much more in evidence in men than in women?

Again, chronic bronchitis is much more frequent in the lower social classes, whereas allergic disorders are if anything more common in the middle and upper classes?

Why is chronic bronchitis so common in this country? So common in fact as to deserve the title of "the English disease."[1] Are we in fact constitutionally inferior to other nations or are there other explanations?

Other points which are more easily explained are the increased frequency of chronic bronchitis in smokers, in urban and industrial areas, and in the elderly. In all these the explanation may be the extra irritation in an already weakened mucosa.

How then can we answer these questions if we are to accept the ætiology of an allergic constitution? As I see it there is only one way in which this can be done and that is by following our patients from the cradle to the grave in an attempt to find out whether the catarrhal children do in fact become chronic bronchitics. It is generally agreed that patients' histories are unreliable. We should therefore pick out the catarrhal children that we see in general practice and arrangements should be made to record and follow their progress through life. Obviously the present generation of practitioners will not be able to follow the children now under their care to

1. *Brit. med. J.* 1953, ii, 268. Fry, *J. Ibid*, 1954, i, 190.

their graves, and we should make plans for a continuation of our observations by the next generation. Admittedly this is a lengthy method of investigation into the causes of chronic bronchitis and it is very possible that in the years to come some other measures will be found to prevent and treat this disabling condition—but until such a time we would do well to prepare, and start, some such long-term study.

Beckenham, Kent. JOHN FRY.

## THE PHYSIOLOGY OF CHANNEL SWIMMERS

SIR,—The article by Dr. Pugh and Dr. Edholm in your last issue raises interesting questions on the physiology of heavy muscular work generally.

Ivy [1] has stated that in short periods muscular work can be done at twenty times the basal metabolic rate, and that eight times the B.M.R. is as much as can be maintained for 8 hours. Dr. Pugh and Dr. Edholm estimate that J. Z.'s expenditure of energy averaged 750 calories per hour for 16 hours 23 minutes (or just over ten and a half times his B.M.R.). At this rate of energy expenditure, it is probable that, within 2 hours, J. Z. required to switch over from glycogen to ketone bodies for fuel. J. Z. was, however, in the happy position of having a good supply of that fuel in reserve. Despite a lack of some $7\frac{1}{2}$ in. in height compared with G. P. he was some 20 kg. heavier; and if, as is probable, this weight was fat, then J. Z. had a potential source of energy of some 180,000 calories. Dr. Pugh and Dr. Edholm have pointed out that one advantage of fat people over thin people in swimming the Channel is their ability to lose heat less rapidly because of the thickness of body fat. May not another reason be their enormous fuel reserve in the form of stored fat?

Dr. Pugh and Dr. Edholm say that when J. Z. lay motionless in a bath at 16°C his rate of body-cooling was very low. Actually his rectal temperature fell from approximately 37·8°C to 36·5°C in 2 hours, compared with no fall in temperature when swimming (fig. 3 of article). Perhaps therefore Glaser's advice to shipwrecked people—that they should struggle [2]—is correct for those who are fat? A person of J. Z.'s build, with a store of 180,000 calories, expending say 600 calories an hour struggling, all being equal, would have enough fuel to last him 300 hours.

An interesting corollary to Channel swimming is marathon-running and cycling. Lusk [3] has calculated that cycling 5·3 miles per hour for 15 miles has an energy expenditure of 600 calories per hour. The marathon runner—42 km. (26 miles) in about $2\frac{1}{2}$ hours—has probably a greater expenditure of energy per hour, though over a shorter period, with a total output in 24 hours less than the Channel swimmer or the cyclist. Barach [4] has carried out interesting studies on marathon runners. At the end of the race fevers up to 102°F to 104°F were common; there was extreme nervousness, excitement, cold sweat, rapid pulse, facial pallor, and at times unconsciousness lasting 12 hours, all akin to hypoglycæmia. (The runner of the first marathon race in 490 B.C. dropped dead.) There was weight loss of 3–8 lb. —part of this due to loss of moisture. The urinary findings showed albuminuria, ketosis, and the presence of blood and casts. In some cases the albuminuria lasted 3 weeks. It would be interesting to know whether Channel swimmers also develop evidence of such renal damage. One would certainly expect ketosis.

It is not easy to compare the relative feats of endurance of Channel swimmers and marathon runners. The Channel swimmer needs and has fat enough to provide him with fuel for the journey. The problem of the marathon runner is different: he carries little fat, yet even that small reserve is called upon. The Channel swimmer, as Dr. Pugh and Dr. Edholm have pointed out, has to contend with waves, wind, and current (also, although not mentioned, water pressure on the thorax equivalent to an 8 kg. sandbag, according to Lusk). He has, however, two advantages over the marathon runner—namely, a water-cooling system and a great reserve of fuel.

Whether or no Channel swimming is the greatest feat of endurance in the world of sport is for others more competent to judge; but no woman (to the best of my knowledge) has yet run the marathon, and certainly not within 3 hours. Women, however, have swum the Channel, and at a speed competitive with men (table VIII of article).

West London Hospital, London, W.6. J. DOUGLAS ROBERTSON.

1. Ivy, A. C. *J. Amer. med. Ass.* 1942, **118**, 569.
2. Glaser, E. M. *Nature, Lond.* 1950, **166**, 1068.
3. Lusk, G. The Elements of the Science of Nutrition. Philadelphia, 1928.
4. Barach, J. H. *Arch. intern. Med.* 1910, **5**, 382; *Amer. J. dig. Dis.* 1943, **10**, 134.

## STAFFING THE TRANSFUSION SERVICE

SIR,—Your annotation of July 16, which I regarded as authoritative, stated that several laboratories of the National Blood Transfusion Service were having difficulty in finding technical staff, and that technicians do "transfer as soon as they can from these specialised units to hospital laboratories where the work is of wider scope and of more relevance to their examinations." You went on to say that "standards of work have had to be lowered" and a senior administrative medical officer had asked hospitals to limit their use of blood to urgent cases. The "battle" (to which Dr. Weiner refers in his letter of Oct. 1) consisted of an attempt by you, Dr. Bowley, and myself to discuss in public certain factors which have resulted in the Sheffield centre's present difficulty, with less than half its establishment filled.

If we omit the demagogic imputations (such as the one where it is implied that I suggested the regional centres should refrain from all antenatal work), there is only one section of Dr. Weiner's letter which requires further study, and that is his suggestion that all expectant mothers should be screened for all recognisable antibodies. The frequency of Rh antibodies in Rh-negative expectant mothers is about 1% (1 in 122 according to Dr. Bowley) and these can be detected by an ordinary albumin test which, when done on a large scale, requires only 1–$1\frac{1}{2}$ minutes of technicians' and cleaners' time. The labour cost for each case of Rh immunisation discovered is thus 120–200 minutes or 2–$3\frac{1}{4}$ hours. If one extends the search to the other antibodies, one must use the anti-globulin technique because many of these antibodies can be demonstrated in no other way, and the labour cost at once rises to at least 3 minutes per sample, probably more. I do not know of any reliable figures for the frequency of those rarer antibodies which are of clinical significance, but I doubt if they are commoner than 1 in 5000, and they may be much less frequent. (This is a matter on which Dr. Weiner's experience would be of great value, were he to give it to us.) If the frequency be 1 in 5000, the labour costs per case discovered go up to some 15,000 minutes, 250 hours, or 35 days; the financial costs rise from less than £1 to well over £50 per case.

This, Sir, in the present state of the National Health Service, is a fantastic waste of money. For lack of staff and for lack of space I am unable to perform routine estimations of hæmoglobin on our expectant mothers, even though in a sample of 227 we found that 44% had hæmoglobin levels below 11·8 g. per 100 ml.; yet we know that miscarriage and stillbirth are correlated with anæmia, and I hazard a guess that £50 p.a. spent on this work would save the life of more than one infant. I hear of provincial laboratories still using chemical methods for the estimation of sodium and potassium—and in some such places a flame photometer would save not one but several lives each year.

This correspondence illustrates a matter which has troubled the leaders of our profession for some years—the stultifying effect of concentration on a narrow specialty. The recent development of blood serology has caused a minor revolution in clinical medicine, but the ultra-specialisation which has accompanied it has led to senior appointments sometimes being given to persons with little laboratory experience outside their super-specialty. Such persons are unable to compare the value of work within their specialty with that of work outside it—just as the Schoolmen could debate lucidly on the number of angels who could dance on the point of a needle, but regarded the new art optic as a device of the devil. All the money spent by the National Blood Transfusion Service comes from the National Health Service, and if spent on the rarer antibodies is not available for common tests like the estimation of hæmoglobin, which, though less spectacular and less likely to lead to a new paper, may well save more lives. Some of my colleagues are straining out their gnats and leaving me to swallow camels.

Central Middlesex Hospital, London, N.W.10. GEORGE DISCOMBE.

## GENERAL PRACTICE

SIR,—Dr. Hunt, in his review of the possibilities of general practice (Oct. 1), says that "crowded outpatient departments and shortage of hospital junior medical staff might be remedied by enlisting the help of family doctors in the work of outpatient departments." This, of course, is often done and can be very valuable, but there are disadvantages, some of which he notes later.

The increase in outpatient lists in recent years is to a considerable extent due to follow-up work, only a small proportion of which is part of any organised clinical research. It has become accepted that the continued periodic supervision which is so often needed is the function of the outpatient clinic rather than of the doctor's consulting-room, and the doctor has been so busy that he has hardly noticed that this, which could and should be a most interesting and rewarding part of his work, has been very largely taken away from him. He does not, at least, seem to complain about it very much.

It is this—follow-up work—which he will generally help to do in the outpatient clinic, and there might be a great deal to be said for the idea that instead of following his patients into the hospital, he should demand to have them back after consultation or assessment, and that we in turn whenever possible should refer cases needing follow-up back to him, and only see them again at his request.

I have often discussed this, which is increasingly my own view, with both general-practitioner and consultant colleagues. It is sometimes argued that if such cases—the baby who may become anæmic or the child who may be developing bronchiectasis are two among many possible examples—are referred to the family doctor with the suggestion of weekly, monthly, or six-monthly follow-up in the surgery precisely nothing happens and the patient may suffer. This is sometimes true, perhaps because the organisation in the past has been that of expediency, and planned and recorded follow-up over months or years has not been in the tradition of surgery work. But it becomes steadily less true as more doctors in general practice have diagnostic facilities at their disposal, as the bad general practice of the Collings report is replaced by the good general practice of Stephen Taylor, and as the old morning and evening surgery begins to be replaced by the custom of seeing patients by appointment.

The more effective integration of hospital and general-practitioner services, about which so much has been said and written, will surely be better achieved by making them more closely complementary than by each trying to invade and take from the work of the other. This surely, too, is a further and most important way of improving the scope and development of general practice on which Dr. Hunt writes with such enthusiasm. It is also immediately practicable, whereas the provision of his general-practitioner beds in greater numbers may have to wait until there are enough beds for cancer cases to be admitted at once, and enough effectively to reduce the long waiting-lists for such procedures as hernia operations and perineorrhaphies, and enough nurses for the beds which already exist.

Royal Berkshire Hospital, Reading. J. J. KEMPTON.

## THE LUNGS IN MITRAL STENOSIS

SIR,—I thought your leading article of Oct. 1 dealt with the rapidly expanding literature in a remarkably comprehensive and helpful way. I would, however, question your statement: "Absence of the changes [i.e., in the lung] does not exclude a tight stenosis, but their presence virtually establishes it."

I believe the first proposition is untrue. I have yet to see a patient with serious mitral stenosis who had normal lung-fields. Indeed, I concluded my paper [1] to which you referred with the words: "A normal lung architecture is inconsistent with a diagnosis of severe mitral stenosis."

The second proposition is also untrue in my experience. The changes you described are not diagnostic of severe stenosis. Similar radiographic appearances may be found, at a single examination, in left heart-failure. Persistent changes of the mitral type indicate serious obstruction at the mitral valve, but this obstruction may be due to rigidity of the valves without severe stenosis.

The matter is one of great practical importance, for if my observations are correct patients with normal lung fields do not require surgical treatment. Those with persistent abnormalities of the mitral type should be recommended for valvotomy, provided there are the signs of a pliant valve [2] and no absolute contra-indications.

Purley, Surrey. D. S. SHORT.

## TREATMENT OF SHOCK

SIR,—The papers by Dr. Murray and Dr. Bruce and Dr. Danziger (Oct. 1) were stimulating and their publication in the same issue made interesting comparisons possible. The diagnosis of irreversible shock as described by Dr. Danziger, and in particular "the feeble and evanescent pressor effect of noradrenaline," conflicts with the "continued response to infusion of noradrenaline" described by Dr. Murray and Dr. Bruce. The latter were able to maintain a blood-pressure of 110/80 mm. Hg with continued infusion of noradrenaline although when the infusion was stopped the blood-pressure was unrecordable.

In both articles the noradrenaline was given in the blood-drip, but in this method the rate of transfusion is determined by the response to noradrenaline. It would seem better to give the noradrenaline separately so that the blood or other fluid can be administered at a chosen rate to suit the patient's requirements.

Dr. Danziger employed noradrenaline at a time when his patient was bleeding profusely, whereas Dr. Murray and Dr. Bruce did not use the drug until the uterus and vagina were packed and the bleeding was presumably controlled. It must be admitted that in their patient bleeding began one hour later and continued until hysterectomy was performed, although with the uterus packed the quantity of blood lost was probably adequately replaced by blood-transfusion. It is certainly a possibility, based on numerous published reports and a limited personal experience, that had Dr. Danziger employed noradrena-

1. Short, D. S. *Brit. Heart J.* 1955, **17**, 33.
2. Sellors, T. H., Bedford, D. E., Somerville, W. *Brit. med. J.* 1953, **ii**, 1059.

line after the bleeding had stopped and the blood-volume was approximately restored (at the time of the "failed" intra-arterial drip) he would have had a different response.

The relative merits of noradrenaline and intra-arterial transfusion deserve close investigation, and the indications for using one or the other are by no means clear. Dr. Murray and Dr. Bruce were confronted by so alarming a collapse in their patient that they chose noradrenaline as the most readily available means of restoring the blood-pressure. Their choice was vindicated by the response, although Dr. Danziger obtained a similar result with intra-arterial transfusion in equally desperate circumstances.

One point in resuscitation seems to stand out prominently. As long as serious hæmorrhage persists, the treatment is adequate blood replacement, with two drips if necessary. If, when bleeding is controlled and the blood-volume adequately restored, the blood-pressure cannot be raised, the choice of intra-arterial transfusion or noradrenaline remains. More information on this subject is required.

Leith Hospital, Edinburgh. I. E. W. GILMOUR.

SIR,—There are several points in the article by Dr. Murray and Dr. Bruce which merit comment and discussion, but for the sake of brevity I would like to draw attention to two especially.

The profound hypotension during the packing of the uterus and vagina under ether and oxygen anæsthesia does not appear to be due, as the authors suggest, to the shock engendered by this procedure, but rather to the cardiovascular depressant properties of ether in the presence of adrenergic blockade, in this instance brought about by intramuscular chlorpromazine and pethidine half an hour before the anæsthetic.

The experiments of Brewster and others [1] have shown that "a critical myocardial depression with resultant hypotension or cardiac arrest may result from the direct depressant effect of diethyl ether upon the myocardium of a patient in whom the reflex increase of epinephrine and nor-epinephrine from the adrenal medullæ and sympathetic nerve endings is reduced or abolished. This danger is present under the following conditions: (*a*) pathological or surgical ablation of the adrenal medullæ, or pathological hypofunction of the adrenal medullæ as in bilateral adrenalectomy, Addison's disease, Cushing's syndrome, adrenogenital syndrome, etc., (*b*) surgical sympathectomy or pharmacological sympathetic ganglionic blockade, (*c*) otherwise subnormal or 'exhaused' sympathoadrenal response to stimuli, (*d*) in the hypothyroid individual and (*e*) during deep Pentothal anæsthesia." This is no reason why chlorpromazine should be an exception to this statement.

Dr. Murray and Dr. Bruce preface their discussion by indicating that I and several others advocate "this type of potentiated anæsthesia" (presumably hypothermia *and* intravenous chlorpromazine, promethazine, and pethidine) "as a means of allowing surgery on patients formerly considered unfit for operation." For my part, I would like to make it quite clear that I do not consider that hypothermia is either necessary or useful when these drugs are used. On the other hand, there is a danger of hyperthermia if these patients are overheated, and for this reason it is advisable to work in cool theatres, and avoid artificial heating when the patient returns to the ward.

I do not wish my remarks to be taken as adverse criticism of a bold and courageous attempt to deal with an admittedly desperate situation. The means at our disposal of preventing and treating severe shock are at present meagre, and the ætiology of the condition becoming more and more confused, as Dr. Danziger's discussion (Oct. 1) indicates. There is a growing amount of clinical and experimental evidence that chlorpromazine without hypothermia has valuable preventive properties against shock and the non-specific responses to aggression. There are, however, many points needing clarification. I would suggest for a start that hypothermia be omitted until we can assess the value of the drug itself under normal working conditions. Furthermore, there is a case against using ether, and possibly the more toxic general anæsthetic agents, in conjunction with chlorpromazine.

Lambeth Hospital, London, S.E.11. D. A. BUXTON HOPKIN.

SIR,—After reading the article by Dr. Murray and Dr. Bruce recounting their management of a case of post-partum hæmorrhage, I wondered whether the possibility of fibrinogenopenia had been considered. It seems a distinct possibility in a 5-gravida, who early in the resuscitation received 0·57 litre of dextran, and in whom laparotomy revealed a firmly retracted uterus.

Burntisland, Fife. D. E. B. POWELL.

## NUMBERING OF FINGERS

SIR,—Will you please tell Dr. Forbes (Oct. 1) that while (like many others) I have only eight fingers, I have ten digits on my hands. If we always used the correct term in describing these organs mistakes would be fewer.

After all, even if the "ordinary" man says gasteritis, casuality, lumbar punch, penicillian, and flat feet, there is no need for doctors to imitate them. It was not Alice but the Mad Hatter who said, "You might as well say 'I say what I mean' is the same thing as 'I mean what I say.'" It is nearly everyone who says, "My hair wants cutting" when they mean "My hair needs cutting." Nearly everyone says, "Can I have a piece of cake?" when they mean "May I have a piece of cake?"

It is not pedantic to be exact—it is scientific—and much simpler—and shorter—and certain.

Manchester, 3. W. SAYLE-CREER.

## POLIOMYELITIS AND TONSILLECTOMY

SIR,—Laryngologists will be very interested to read Dr. James Melvin's letter last week, and members of the British Association of Otolaryngologists know that our council keep this problem under review and from time to time call our attention especially to "relevant passages" in official memoranda.

My senior colleagues will remember that the old-fashioned operation of tonsillotomy with removal of adenoids brought relief to many children suffering from lymphadenoid-tissue "stenosis" and also reduced the incidence of recurrent acute infections more readily attacking the enlarged palatine tonsil, though they could not approve of so uncertain a technique. I believe that this objection was one of the reasons why principal school medical officers were advised to call upon some of us in the early days after the first world war to assist them in our capacity as specialists, though at the same time providing us with the opportunity to persuade education authorities to establish rational E.N.T. clinics rather than departments for T. and A. operations.

The problem of the physiology and clinical pathology of the lymphadenoid tissue of the pharynx continues to be of great importance to our specialty, and Dr. Melvin's experience is most stimulating.

For some time I have nursed a secret heresy that one day part removal of the enlarged and pedunculated palatine tonsil may return to favour, but in the form of deliberate selective tonsillotomy. I have very occasionally dared to perform such an operation, and I remember the loud cries of disapproval from a full house of the section of laryngology of the Royal Society of Medicine when, speaking from the rostrum, I confessed that for one of my own children I had done a deliberate selective tonsillotomy for which I had unearthed a discarded reversed Heath's guillotine and sharpened it for the

1. Brewster, W. R., jun., Isaacs, J. P., Waine-Andersen, T. *Amer. J. Physiol.* 1953, **175**, 399.

occasion. The clinical result has been excellent; the very frequent acute attacks with fever ceased at once and the architectural result is most pleasing.

For many years I have respected a theory of Torsten Skoog [1] of Stockholm that the lymphadenoid tissue of the pharynx has a sensitising effect on the reticulo-endothelial system of the body. Dr. Melvin now postulates that these tissues may act "as a filter and buffer protecting over the 9th and 10th cranial-nerve offshoots in the area," presumably against the ascent to the central nervous system of the virus of what used to be called more often "infantile paralysis."

Liverpool, 1. H. V. FORSTER.

## THE UNCONQUERED STAPHYLOCOCCUS

SIR,—Your leading article last week gives many admirable suggestions for attacking this most tenacious of microbes. One point, however, seems to me to need qualification.

You suggest that the use of typing methods will tell us which strains "are actually dangerous." I do not think this is necessarily the case. Although there is some evidence to suggest that certain phage-types of staphylococci are associated with certain types of infection, coagulase-positive staphylococci of all phage-types can cause suppurative lesions and strains belonging to each of the three phage-groups have been isolated from fatal cases of septicæmia.

It seems probable that all strains of coagulase-positive staphylococci become increasingly virulent by passage through infective processes, and recent studies suggest that virulence decreases when a strain is harboured in the anterior nares in a community devoid of sepsis. If this be true it is more important to know the source of a strain than its phage-type. It is, of course, true that a single strain of *Staph. aureus* may be responsible for most cases of infection occurring in a given ward or institution, in which case phage-typing studies may help to show how the infection is being spread. It would, however, be dangerous to assume that certain phage-types are invariably less virulent than others.

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London, S.E.1. MARY BARBER.

## ANOXIA IN RESPIRATORY INFECTIONS OF CHILDHOOD

SIR,—Dr. Brenda Morrison must be congratulated on the effective oxygen concentrations that she has produced in the high-tension oxygen box described in her article last week.

The graph in which performances of the experimental box and the standard oxygen tent are compared does nothing to upset the fallacy that to introduce a flow of 5 litres of oxygen per minute into a standard tent constitutes effective oxygen therapy.

The reverse is usually the case. The patient who, outside a tent, might have received a reasonable oxygen supply by mask or catheter, is placed in an atmosphere of air when presumably his oxygen deprivation is at its highest, and the oxygen concentration is raised slowly at the rate of approximately 1% per minute. To flush fill a standard oxygen tent by increasing the main supply usually results in the blowing off of the rubber connections because the flow is limited at the Venturi jet.

In my experience a double oxygen supply is the most effective method of achieving a satisfactory clinical result. In the case of patients requiring the maintenance of a previous high concentration such as is found during anæsthesia, the secondary supply is delivered to the patient inside the tent by means of an oxygen mask or catheter, and this is not removed until the tent oxygen concentration is deemed satisfactory. Alternatively, the secondary supply is flushed into the tent by a tube inserted through one of the service flaps or through one of the cooling ports.

It needs to be impressed upon the nurses that this routine must be repeated each time that the tent is opened widely for nursing attention.

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St. Lawrence Hospital,
Chepstow, Mon. HARRY MIDDLETON.

## ADRENALINE OVERDOSAGE

SIR,—I should like to comment on two of the recommendations made by Dr. Freeman (Sept. 17).

He very reasonably suggests that piperoxan or phentolamine should be kept at hand for the treatment of adrenaline overdosage. He might also have mentioned that when it is used systemically, adrenaline should be injected into one of the limbs, so that a tourniquet can be applied above the site of injection if necessary. Even if no adrenaline antagonist is available, the intermittent release of the tourniquet for a few seconds, at 5–10 minute intervals, would probably enable the patient to inactivate an otherwise lethal dose of adrenaline.

I must disagree with Dr. Freeman when he wants to restrict the use of adrenaline for inhalations to solutions containing 0·4% or less. Many patients derive no benefit from such solutions, and more powerful inhalants are often needed. There is, however, a good case for substituting isoprenaline for adrenaline in all inhalants; it is at least as effective, and is much less likely to be injected.

Department of Therapeutics,
St. Thomas's Hospital Medical
School, London, S.E.1. ANDREW HERXHEIMER.

## VESICO-CŒLOMIC DRAINAGE

SIR,—Mr. Desmond Mulvany's vesico-cœlomic operation for relief of ascites would appear to be an ingenious procedure of undoubted value when a diagnostic laparotomy is being performed. However, where surgical proof is not required, it may be questioned whether a major operation is justifiable when the span of life is usually so short.

> Why so large cost, having so short a lease
> Dost thou upon thy fading mansion spend.

Experience of a recent case prompts me to suggest a very simple procedure which is likely to be of more general application and which should make repeated paracenteses unnecessary.

In a woman of 50, in whom a diagnosis of carcinomatosis peritonei was made on clinical grounds, the presumptive evidence was sufficient to obviate a diagnostic laparotomy. She had been tapped three times at increasingly frequent intervals until 8 pints of fluid (containing 2·5 g. per 100 ml. of protein) had to be removed after an interval of five days. I then introduced a size-one 'Polythene' tube through the paracentesis cannula into the abdominal cavity, and removed the cannula, leaving the tube in position, with a small glass olive-shape-ended rod as a spigot. Inexperience in the first instance led me to pierce the tube with a holding safety-pin, but this was a mistake and ascitic fluid leaked round the pinholes. After re-introducing another length of tubing, no further snags were encountered; the tube never became blocked (a little manipulation was sometimes necessary), there was no sepsis, hardly any skin reaction, no pain or discomfort, and positively no leakage round the wound. The patient remained completely comfortable with a daily drainage of one to two pints of fluid until her death seven weeks later. Her gratitude at not being subjected to the frequent ordeals of paracentesis—followed as they were by a day of complete exhaustion and then a crescendo of distension, discomfort, and anticipation until the next tapping—was a consoling factor in the conduct of her illness. Nor, with the simple daily manipulation of removing a spigot, was it difficult to disguise deterioration from her, so that she died in some comfort and contentment.

London, W.1. S. CHARLES LEWIN.

1. Skoog, T. *Acta Otolaryng., Stockh.* 1936, **23**, fasc. 1.

## SEQUELS TO ANÆSTHESIA

SIR,—Recent discussion in your columns seems to have established (1) the safety of nitrous oxide properly administered, (2) the danger of anoxia, and (3) the intolerance of the elderly to hypotension. Yet it would seem that more than passing mention should have been made of the rôle of nutritional deficiency in the production of cerebral metabolic disturbance.

A recent case, which is by no means the first we have witnessed, may illustrate the unexpectedness, and importance of early treatment, of this condition.

A healthy, active old gentleman of 78 was admitted with nine months' history of hæmaturia, frequency, and dysuria. He was in otherwise sound mental and physical condition, without evidence of biochemical upset, anæmia, or urinary infection, nor was there anything in history or examination to suggest dietary deficiency.

On admission his blood-pressure was 160/80 mm. Hg. It had fallen to 110/70 after premedication with morphine gr. $^1/_6$ and atropine gr. $^1/_{100}$ immediately before induction of anæsthesia for Wilson-Hey prostatectomy on Sept. 9, 1955.

The anæsthetic technique was a modification of that described by Gray [1 2] in which spinal analgesia is induced under light thiopentone/pethidine/nitrous-oxide anæsthesia, the patient tilted into the Trendelenburg position, and the labile blood-pressure controlled by intravenous infusion of noradrenaline. In this instance analgesia was obtained up to the costal margin with 1·5 ml. of 0·5% hyperbaric cinchocaine before establishment of sleep with 250 mg. thiopentone and a gas flow of nitrous oxide of 5 litres per min. and of oxygen 2 litres per min. in semi-closed circuit.

The blood-pressure was measured at least twice every 5 minutes until stabilised, and was kept closely to the pre-operative level except for two brief periods when it was permitted to fall to 90/60 to facilitate surgery. Towards the end of the operation methoxamine, given intravenously and subcutaneously, was substituted as vasopressor; this briefly raised the blood-pressure to 165/110, with accompanying nausea and retching, upon which inhalation anæsthesia was discontinued before any hypoxia could arise from laryngospasm or aspiration. He was awake before the end of the $1^1/_2$-hour operation. Measured blood-loss was less than 10 oz.

Postoperatively, in the ward he appeared drowsy but orientated. An infusion of blood was started, but stopped on the appearance of rigors. These made accurate blood-pressure readings impossible, but there does not appear to have been any hypotension at this time.

There was no postoperative vomiting or headache; urine secretion was free, with fluid intake matched to output by oral and intravenous administration. Prophylactic chemotherapy with penicillin (0·5 mega unit) and triple sulphonamide (1 g.) every 6 hours was started.

About 24 hours after operation it became obvious that he was confused, childish, and restless. On the second post-operative day full diet was resumed, but there was an episode of restlessness and disorientation controlled with phenobarbitone sodium gr. 3. The third day saw a serious deterioration in his condition, necessitating restraints, and paraldehyde was used to control him at night. The following day his condition was worse, so that he could be induced to eat or drink little. He was apyrexial. On the evening of this day, in the belief that a cerebral metabolic disturbance was the cause, he was given intramuscularly thiamine 10 mg., riboflavine 4 mg., nicotinamide 40 mg., pyridoxine 4 mg., and ascorbic acid 100 mg. The following morning found him greatly improved; he was rational and a normal diet was resumed. Parenteral vitamin therapy was continued daily in the same doses, and chlortetracycline (aureomycin) (500 mg. twice daily) was substituted for the previous chemotherapeutic agents. Uneventful recovery proceeded, and he was discharged on the 12th postoperative day, apparently unimpaired mentally, although it is still too early for his family to assess whether personality changes have occurred.

A single such report proves nothing, but the dramatic halt of a progressive mental deterioration by parenteral vitamin therapy is extremely suggestive, although the good original physical state, the absence of vomiting, and the small quantity of depressant drugs used might all suggest that the hypotension permitted during anæsthesia was the primary cause.

Many possible reasons for the development of post-operative avitaminosis can be adduced, including the influence of antibiotics on intestinal flora, interference with diet, or the increased demands for "stress-factor" vitamins during intravenous carbohydrate infusion and the metabolic demands of tissue breakdown and repair. Anoxia, also, will cause increased vitamin loss from the enzyme systems of affected cells; to reconstitute these cells such vitamins are needed.

Old people are presumably more susceptible through their decreased dietary intake of frequently inferior soft foods, and their greater liability to cerebral derangements.

The essential point surely is the danger of controlling such a patient with sedatives only: their use makes mental confusion frequently worse confounded, and continued reliance upon them in place of specific therapy might well lead to permanent cerebral change in view of the worse prognosis of nutritional dementias in the aged.

Dr. Bedford's cases no. 1, 4, and 6 (Aug. 6) might therefore cast suspicion as much upon postoperative management as upon anæsthetic technique.

For permission to publish this case-report our thanks are due to Prof. C. A. Wells, under whose care this patient was admitted.

PATRICK A. FOSTER
AUDREY M. HILLARY.
Liverpool Royal Infirmary.

1. Gray, T. C. *In* Prostatectomy, by C. A. Wells. Edinburgh, 1952; chapter VII.
2. Gray, T. C., Marcus, R. *Brit. J. Anaesth.* 1949, **21**, 182.

## CONTROL OF INFECTION IN A UROLOGICAL WARD

SIR,—In connection with our article, of Aug. 13, we would like to point out that the 'Dettol' used in the bacteriological investigations was that sold commercially in 1950. The manufacturers have advised us that the dettol formula was modified in 1952 and that it now has greater efficiency against *Pseudomonas pyocyanea*. They further state that the bacteriological report on this formula from a London teaching hospital is available to those interested.

L. N. PYRAH
W. GOLDIE
F. M. PARSONS
F. P. RAPER.
General Infirmary at Leeds; St. James' Hospital, Leeds.

## EXPELLING TAPEWORMS WITH MEPACRINE

SIR,—I agree with Dr. Beatty and Dr. Idris Jones that Dr. Seaton's sweeping condemnation of filix mas (Sept. 24) calls for a word in defence of this time-honoured anthelmintic.

There are several reasons why filix mas is undeservedly falling into disrepute, chief of which are (1) the use of old instead of fresh material, (2) inadequate dosage, and (3) neglect of the all-important principle of starvation before treatment. In addition, treatment by duodenal intubation will fail if it is not appreciated that nearly half the extract sticks to the inside of the tube. A test with a Rehfuss tube will show that 15 ml. of the liquid extract has to be administered in order to deliver 8 ml. (120 minims) at the distal end. Our experience has been, however, that treatment by tube is no more effective than by mouth.

At this hospital we insist on starvation and saline aperients for three days before treatment in adults, and we have been able to cure at least 7 out of every 10 patients with one treatment by mouth or by tube. We have found that emulsions by mouth are more effective than capsules, but even better results are now being obtained by the addition of glycerin.

24 patients have recently been treated here, under the care of the consulting physicians, with an emulsion containing

90–120 minims of liquid extract of male fern and 1/2 oz. of glycerin, given by mouth in 3 divided doses at fifteen-minute intervals. 1/2 oz. magnesium sulphate was given two hours later, followed by a pint of fluid. 23 of the patients harboured *Tænia saginata*, and 1 *T. solium*; 22 treatments were successful (two scolices being passed in one case), 1 was doubtful, and 1 failed. Our 1 failure was successfully treated at the second attempt.

This represents a cure-rate of at least 90% at one single treatment, and compares favourably with Dr. Seaton's report of 3 failures out of 15, using mepacrine by duodenal intubation—i.e., 80% success. The manner in which glycerin exerts its beneficial effect has yet to be determined.

Hospital for Tropical Diseases,
London, N.W.1. W. H. JOPLING.

## PIPERAZINE AS ANTHELMINTIC

SIR,—The results of our investigations in the tropical medicine department of Alexandria University Hospital serve to amplify previous findings in the treatment of ascariasis with piperazine hydrate.[1–3]

Of the anthelmintics commonly used, santonin, tetrachloroethylene, and oil of chenopodium are not devoid of toxicity and are somewhat unreliable. Hexylresorcinol, though almost non-toxic, may irritate the upper gastro-intestinal tract. All these agents require preliminary starvation of the patient, and purgation afterwards to rid the bowel of the drug as well as the worms.

In contrast, piperazine citrate ('Antepar') has little toxicity, and does not kill the worms. Goodwin and Standen showed by in-vitro experiments that 1/500 solution gradually immobilised the worms in six to eighteen hours. They concluded that such immobilisation of the worms lessened the risk of occlusion or perforation of the gut, or migration to the bile-ducts during treatment. Starvation or purgation was unnecessary with this form of treatment.

The object of our recent study was to decide whether it is better to give piperazine citrate in one single dose or in a course of seven daily doses.

*Method.*—Only patients passing numerous ascaris eggs of normal fertilised appearance were selected. Stools were examined by the direct smear and by the salt flotation technique. Each patient was asked to report next day and tell us how many worms had been passed, and stool examination was then carried out weekly for four weeks. Magnesium sulphate was not given after the piperazine citrate.

Patients were divided into two groups. Those in the first group of 50 were given a single dose—namely, 3 g. for adults and for children weighing over 25 kg., and 2·5 g. for children weighing less than 25 kg. Only 26 patients from this group were followed up for one month, and of these 22 were clear of worms.

30 patients in the second group were given a daily dose for seven days—0·75 g. for children 2–3 years old, 1·0 g. for those of 3–10, and 1·5 g. for those patients over 10. Of the 20 followed up for one month, all were cured. The effects of this treatment on other associated helminthic infestation in this group were:

| Infestation | Total no of cases | No. of cured cases |
|---|---|---|
| Oxyuriasis | 4 | 3 |
| *Trichocephalus dispar* | 2 | 1 |
| *Hymenolepis nana* | 2 | 1 |
| Trichostrongylus | 3 | 1 |
| Ancylostoma | 3 | 0 |

Thus the course of seven daily doses gave a cure-rate of 100%, and also cleared three-quarters of the oxyuriasis, half of the trichocephalus and hymenolepis, and a third of the trichostrongylus infestations; but it was ineffective for ancylostoma.

Though the results of the single-dose treatment are inferior, it has of course considerable advantages when one is dealing with large numbers of patients whose attendances are unreliable. The absence of toxic reactions from the doses we used suggests that larger single doses could safely be tried in the hope that they will give a higher rate of cure.

I wish to express my appreciation to Dr. H. H. Salem, professor of tropical medicine, for his assistance and suggestions and to Dr. A. Khidr for his help in this work.

Faculty of Medicine,
Alexandria. ALY Z. SHAFEI.

SIR,—White [3] and Dunn [1] found that a three-day course of treatment with piperazine (citrate or adipate) could cure ascaris infestation. Goodwin and Standen,[2] on the other hand, used single doses—3 g. of the citrate for persons weighing over 20 kg. and 2 g. for those weighing less. In many of their cases the ascaris worms were expelled; but the significance of their findings is reduced because in some cases stools were examined only once (five to seven days after treatment) and in some they were not examined at all.

Our own investigation was designed primarily to assess the value of these two piperazine salts (piperazine citrate and piperazine adipate) when given in single large doses for the removal of ascaris; but their effect on other helminthic infestations was studied incidentally. Cases comprised mainly patients above 14 years of age with body-weights between 40 and 80 kg. Dosage of the adipate ranged from 4·5 g. given in one dose to 8·1 g. given over three days. In the case of the citrate, the single doses were 3 to 5 g. Repeated treatment with single doses was also given.

No toxic symptoms or signs were observed at any time, apart from slight dizziness, mild colicky pains, and a sensation of "something moving inside."

Stool examination was done by the saline flotation technique. Stool examination (and, in cases of oxyuriasis, swabbing of the perianal region) was performed daily during the two weeks following treatment. The results were:

| Drug | Infestation | No. of cases treated | Total dose given (g.) | Duration of treatment (days) | Cases in which worms were expelled | No. of cases cured |
|---|---|---|---|---|---|---|
| Piperazine adipate ('Entacyl') | Ascaris | 8 | 4·5 | 1 | 6 | 2 |
| | | 3 | 8·1 | 3 | 3 | 3 |
| | Ancylostoma | 4 | 4·5 | 1 | .. | .. |
| | | 1 | 8·1 | 3 | .. | .. |
| | Trichostrongylus | 3 | 4·5 | 1 | .. | 3 |
| | Heterophyes | 1 | 12·6 | 7 | .. | 1 |
| | *Tænia saginata* | 1 | 4·5 | 1 | .. | .. |
| | *Hymenolepis nana* | 3 | 4·5 | 1 | .. | .. |
| | Oxyuriasis | 5 | 12·6 | 7 | .. | .. |
| | | 1 | 25·2 | 14 | .. | 1 |
| Piperazine citrate ('Antepar') | Ascaris | 11 | 3 | 1 | 7 | 4 |
| | | 3 | 5 | 1 | 1 | .. |
| | | 2 | 6 | 2 | 2 | .. |
| | | 2 | 9 | 3 | 2 | .. |
| | | 2 | 10 | 2 | 2 | 1 |
| | Ancylostoma | 8 | 3 | 1 | .. | .. |
| | | 3 | 5 | 1 | .. | .. |
| | | 3 | 9 | 3 | .. | .. |
| | | 1 | 8·5 | 3 | .. | .. |
| | Trichocephalus | 1 | 5 | 1 | 1 | .. |
| | Trichostrongylus | 2 | 5 | 1 | .. | 2 |
| | Heterophyes | 1 | 14 | 7 | .. | 1 |
| | *T. saginata* | 1 | 5 | 1 | .. | .. |
| | *H. nana* | 1 | 5 | 1 | .. | .. |
| | Oxyuriasis | 10 | 14 | 7 | .. | .. |

In ascaris infestation, the single-dose treatment with the adipate and the citrate caused the expulsion of most of the worms, but the number of cases cured was small. On the other hand, all 5 cases treated with the three-day course of the adipate were cured, as also was 1 case

1. Dunn, T. L. *Lancet*, 1955, i, 592.
2. Goodwin, L. G., Standen, O. D. *Brit. med. J.* 1954, ii, 1332.
3. White, R. H. R. *Lancet*, 1954, ii, 315.

treated with the heavy dose of the citrate (two doses of 5 g. daily). All 5 cases of trichostrongylus were cured. No cures, however, followed the treatment of the remaining helminths with either salt, apart from one case of oxyuriasis, which was free of infection one month after treatment with 25·2 g. of the adipate spread over fourteen days, and the 2 cases of heterophyes which were cured by a seven-day course of either salt.

H. F. NAGATY
M. A. RIFAAT
S. SALEM.

Department of Parasitology,
Ein Shams University, Cairo.

## ILIO-INGUINAL BLOCK DISSECTION

SIR,—Mr. Downie has indeed blinded me: but his rhetoric illuminates by the dazzle of undipped headlamps rather than by the sudden clear light of day. I am most interested to see how he has altered his views since his first letter (Sept. 17) in which he suggested that radical-mastectomy flaps healed well because their blood-supply entered from the periphery, whereas ilio-inguinal block dissection wounds healed badly owing to the fact that the blood-vessels in the groin "are arranged like the spokes of a wheel with its hub at the saphenous opening" and are divided in the course of an adequate dissection. He is now (Oct. 1) apparently prepared to dispense with all the arteries that emerge from the saphenous opening, inferring that the collateral circulation from the periphery is just as important. But how does this collateral circulation arrive at its destination if not via the underlying subcutaneous tissues—the very point that I wished to make (Sept. 24).

I am puzzled, too, by Mr. Downie's reference to Trendelenburg's operation.[1] The site of this outmoded and outdated procedure—a simple division of the internal saphenous vein at the junction of the upper and middle third of the thigh—lies some distance away from the area under discussion.

London, W.1. STANLEY RIVLIN.

## MODIFIED ELECTROCONVULSION THERAPY

SIR,—We have read with interest the article by Dr. Kelleher and Dr. Whiteley (Sept. 17). We feel that their practice of giving electroconvulsion therapy without anæsthesia is a step in the right direction, but we know from our experience during the past year that muscle relaxants can also be safely discontinued when the 'Ectonus' technique of E.C.T. is employed.

In this technique, the stimulus is controlled manually in a special manner with the ectonus apparatus. This gives a gradual onset of the tonic phase, and eliminates the clonic phase.

We find this method successful in avoiding fractures and muscle strains, and it is appreciated by patients since they are relieved of the anxiety associated with muscle relaxants.

R. J. RUSSELL
L. G. M. PAGE
T. M. MOYLETT
R. L. JILLETT
A. BUCKLEY.

Three Counties Hospital,
Arlesey,
Beds.

SIR,—The investigations recorded by Dr. Kelleher and Dr. Whiteley on modified electroconvulsion therapy with suxamethonium chloride or suxethonium bromide without anæsthesia, as compared with the use of thiopentone and suxamethonium, may be considered a valuable contribution to the problem of modified electric shock treatments. However, I think the authors' statement, "in view of the risk of fractures and a death rate of 0·8% it is difficult to justify the use of E.C.T. without muscle relaxants," is too positive and sweeping. There are special cases requiring muscle relaxants with or without anæsthesia but the number of these cases is so small in relation to the great number of cases given E.C.T. that it should not justify the application of these drugs as a routine. In this hospital, for example, there have been no fatal complications for the last ten years in more than 3000 convulsive treatments per annum, and the rate of bone complications is a mere fraction per thousand cases, although muscle relaxants with or without anæsthesia are being used only in a very small number of selected cases. I would like to quote a remark by Sargant and Slater[1] on this topic: "To add pentothal and a relaxant to E.C.T. is to add two potential sources of danger, each carrying its own risks of death. The added dangers must be balanced against those eliminated, and all related to the availability or lack of skilled help." Even by eliminating the risks of anæsthesia and adding the possibility of carrying out treatment without skilled help, there is still a risk superimposed to that inherent to the E.C.T., a fact which should be considered in applying modified E.C.T.

The Hospital for Mental Diseases,
Brandon, Manitoba. MILO TYNDEL.

1. Trendelenburg, F. *Beitr. klin. Chir.* 1890, **7**, 196.

1. Sargant, W., Slater, E. An Introduction to Physical Methods of Treatment in Psychiatry. London, 1954.

# Obituary

## THOMAS JONES MACKIE

C.B.E., M.D., LL.D. Glasg., M.R.C.P.E., F.R.S.E.

Dr. T. J. Mackie, professor of bacteriology and dean of the faculty of medicine in the University of Edinburgh, died on Oct. 6, at the age of 67.

He was born in 1888, the son of the late James Mackie, of Hamilton, and he was educated at Hamilton Academy, where he became dux. At Glasgow University he graduated M.B. with first-class honours in 1910 and was awarded the Brunton prize as the most distinguished graduate of the year. He held surgical house-posts at the Western Infirmary, Glasgow, under Sir George Beatson. At first, at the suggestion of Dr. Freeland Fergus, he considered specialising in ophthalmology, but eventually he decided to follow pathology as a career and he returned to the Western Infirmary in the university pathology department as Coats research scholar and Carnegie fellow under Sir Robert Muir.

Mackie's early work included a study of surgical wound infections which led to research on the serological reactions of the coliform group. This was the first study of its kind and he obtained evidence that coli-agglutinin was strain-specific and that lactose fermentation by itself is of no more importance than other sugar reactions as a criterion of typical *Bacterium coli*. During this period he also collaborated with Prof. Carl Browning on the properties and constitution of complement, and on the principles of the isolation of the enteric group of organisms by the use of selective media incorporating brilliant-green.

After he had taken the D.P.H. at Oxford in 1913, Mackie went as assistant in bacteriology to the Bland-Sutton Institute of Pathology at the Middlesex Hospital, where Carl Browning was director. But he was there only a few weeks before he was mobilised as a member of the Territorial Army at the outbreak of war. He spent part of his time in the R.A.M.C. at the military hospital at Mudros and subsequently as officer commanding the sanitary section of the 52nd Division. He also served at Gallipoli and later was in charge of the base bacteriology laboratory at Alexandria. During the war he continued his research on the coliform strains; and his studies on the diagnosis of dysentery and enteric fever, by both bacteriological and serological methods,

corrected the rather doctrinaire teaching about the value of the Widal reaction current at that time, and did much to establish the "atypical dysentery bacillus" as true causal agents of the disease. The loss of most of his records in a torpedoed ship prevented full publication, but much of the work was included in his M.D. thesis on intestinal bacteria, for which he was in 1921 awarded the Bellahouston and the Straits Settlements gold medals.

During the latter part of the war he contracted dysentery and hepatitis and was invalided home. Early in 1918 he was released from the Army to take up the duties of Wernher-Beit professor of bacteriology in the University of Cape Town. He was the first occupant of this chair, and shortly after his arrival Blair Martin, who had come to South Africa at the same time to the chair of pathology, died of influenza, so that for a time Mackie was responsible for both departments.

In 1923 he succeeded James Ritchie as Irvine professor of bacteriology in the University of Edinburgh. His department at that time had heavy teaching commitments. The staff was small but included J. E. McCartney as lecturer and L. S. P. Davidson and A. Joe as assistants. With great energy Mackie rapidly expanded his department. The number of undergraduate and postgraduate classes increased, as did the number of senior students studying for higher degrees. He also continued his research, notably on immunity mechanisms, especially those of whole blood. He carried out extensive investigations into the nature of complement and the mechanisms of serological tests used in the diagnosis of syphilis. A great deal of work on the serological typing of streptococci and the part played by the hæmolytic streptococcus in disease was done by himself and co-workers, while the series of investigations he carried out into postoperative tetanus showed the care and thoroughness with which he approached a problem. Even in later years, when administrative duties within and beyond his department absorbed much of his time, he continued to foster research by his staff.

In 1926 he was appointed to the council of the Lister Institute. In the autumn of the same year he started the bacteriological services for the health authorities in Scotland, and became adviser on pathology and bacteriology to the Department of Health, Scotland. He was active in directing research on disease in fish, and in 1928 was appointed chairman of the furunculosis committee of the Fishery Board. In 1931 he was appointed a member of the Agricultural Research Council and chairman of the research committee of the Animal Diseases Research Association. A great deal of work on *Brucella abortus* infection was carried out in his department, and this was recognised when in 1932 he was made chairman of the Scottish committee on contagious abortion.

At the outbreak of the second world war his organising genius was put to good use, and as regional director of the Emergency Bacteriological Services for South-East Scotland he expanded the services available to practitioners and hospitals. For over thirty years he was honorary consultant bacteriologist to the Edinburgh Royal Infirmary, and after the start of the health service in 1948 he became consultant bacteriologist to the Scottish South-Eastern Regional Hospital Board. After the war he became chairman of the Scottish Hill Farm Research Committee. He was well fitted for this appointment by his wide knowledge of many aspects of animal disease. His interest in the agricultural and veterinary side of his subject extended further, and he became a member of the board of directors of the Edinburgh and East of Scotland Agricultural College and chairman of the Scottish Board of Research in Veterinary Science.

Mackie will long be remembered by many outside Edinburgh for his part in the production of "Mackie & McCartney," a book which is to be found in practically every laboratory in the English-speaking world, and on many another bookshelf. It first appeared in 1925 as *An Introduction to Bacteriology* and went through a continuous and rapid evolution. In collaboration with Professor Browning he also took over Muir and Ritchie's textbook, and when fully revised this became "Browning and Mackie."

Mackie was appointed C.B.E. in 1942, and Glasgow University conferred on him the honorary degree of LL.D. in 1947. After a serious illness in 1950 he returned to full work as soon as possible and took over an increasing number of senior administrative duties in the university until, in 1953, he became dean of the faculty of medicine on the retirement of Sir Sydney Smith.

A colleague writes: "In his earlier days Mackie was interested in the sailing of small yachts, and for some years this was one of his few outside interests. He was passionately fond of the Highlands of Scotland and especially of the Western Isles, through which he made several sailing trips. He was a wide reader and enjoyed travelling, and when relaxed he was an excellent conversationalist and a good companion. Music attracted him, and he was a close friend of the late Sir Donald Tovey. Mackie helped to diagnose a serious illness in Tovey, who showed his appreciation by composing a piano representation of the war between his body and the parasite and its final defeat, but unfortunately the work was never written down.

"The standard he set was always high and many bacteriologists, immunologists, and virologists in high posts today were trained in Edinburgh under Mackie. His teaching was extremely thorough and critical. He often appeared stern and even forbidding to the young undergraduate, but a glint in his eye showed that this was only superficial and in reality he could be easily approached by all."

Professor Mackie married Edith, daughter of the late James Warner of Birmingham, and she survives him with a son and a daughter.

## CYRIL HUTCHINSON WALKER

**M.B. Camb., F.R.C.S.**

Mr. C. H. Walker, who died on Sept. 29 at the age of 94, had been consulting ophthalmic surgeon to Bristol General Infirmary since 1921, but he was still a well-remembered and well-liked figure in the city, for until a few years ago he continued to serve on committees of the Bristol Eye Hospital and to drive his car on shopping expeditions.

He was born at Malton, Yorks, the youngest son of John Walker, rector of Bradwell, Norfolk. He was educated at Haileybury College, Jesus College, Cambridge, and the London Hospital, where he was a dresser to Sir Frederick Treves and a contemporary of Sir Wilfred Grenfell, who was his cousin.

After qualifying in 1886, Walker held resident appointments at the London Hospital and at the Royal London Ophthalmic Hospital. In 1890 he moved to Bristol on his appointment as ophthalmic surgeon to the Bristol General Hospital. In 1893 he took the F.R.C.S. and soon afterwards he joined the staff of the Bristol Eye Hospital. He was also lecturer in ophthalmology to the University of Bristol. During the first world war he was attached to the 2nd Southern General Hospital with the rank of major in the R.A.M.C. His colleagues in Bristol and in his specialty welcomed his guidance, and he was at various times president of the Bristol Medico-chirurgical Society, master of the Oxford Ophthalmological Congress, and a vice-president of the Ophthalmological Society of the United Kingdom.

G. B. W. W. writes: "Cyril Walker thoroughly enjoyed the active life with which his growing family and their student friends filled his house in Clifton and in the country. He took great pleasure in doing jobs well, and on them he brought to bear his ingenuity and invention. The exact technique of ophthalmic surgery, the care and precision in which he was so well trained by Lang and Sir Anderson Critchett, he applied to carpentry, motor-cars, and electric and domestic gadgets. His quiet sagacity made him counsellor of many, but he modestly withdrew in the face of flamboyance or extravagance rather than express disapproval of a way that was not his. In his knowledge of the English countryside, particularly of flowers, shrubs, and insects, he delighted in the resource and contrivance of Nature to adapt and to succeed. There seemed to him no need to 'justify the works of God to Man.' Though he outlived his own generation his youthful figure and lively humour made any mention of geriatrics inappropriate to his old age."

In 1900 Mr. Walker married Dr. Theodosia Caroline Green. She died two years ago and they leave three daughters and two sons, one of whom is a doctor.

# Notes and News

## GENERAL PRACTICE IN NORTHERN IRELAND

THE latest report by the Northern Ireland General Health Services Board [1] shows that in the year 1954–55 the numbers of doctors, including assistants, on the board's medical list rose from 732 to 739; and the average number of persons on a doctor's list decreased from 1906 to 1883. The number of medical partnerships increased from 122 to 135, and the number of doctors engaged in partnership practice from 255 to 282—an increase from 37 to 39% of the total number of principals. At the same time the total number of assistants employed fell from 139 to 133, and the number of assistants whose names are included in the medical list from 25 to 21; in each case the fall was due mainly to the promotion of assistants to principals in partnerships. Concerning health centres, "the board remain of the opinion that they would not be justified in proceeding with the establishment of any full scale centre in Northern Ireland but should consider the possibility of a small centre when fuller information is available of the working of such a centre now built at Stranraer in Scotland."

## SHORTAGE OF MENTAL NURSES

AT the annual meeting of the Royal Western Counties Institution hospital group management committee, held on Sept. 27, Dr. David Prentice, the medical superintendent, said that the group's campaign to recruit mental nurses had resulted in "almost complete failure." "Conditions of service and hours of work" he said, "cannot compete with those offered in industry . . . until the mental deficiency nurse is offered shorter hours, better amenities, and more attractive remuneration, our problem is likely to persist." [2]

A similar warning was given by Dr. W. G. Masefield, a member of the South-East Metropolitan regional hospital board, following the resignation from St. Francis Hospital, Haywards Heath, of five male nurses and two student male nurses.[3] Families, it was stated, cannot live on male nurses' pay. "If the country is not prepared to face up to this situation," said Dr. Masefield, "wards will have to be closed in quite a number of mental hospitals."

## A HOME FOR ELDERLY LADIES

MANY practitioners will be glad to hear of a home to be opened shortly in Dorset "for elderly ladies suffering from a mild degree of mental infirmity." In establishing it, the National Association for Mental Health is attempting to secure suitable care "for those who cannot, without difficulty and considerable hardship to their families, fit into the modern home. The object of the scheme is to prevent the unnecessary admission of such people to mental hospitals and the resulting distress of their relatives." A night and day nursing staff will be provided under medical supervision.

Parnham House is a modernised manor house, with central heating throughout and a garden of 12 acres, situated in the small country town of Beaminster, which is equidistant from Crewkerne and Bridport. The charge to residents will range from 6 guineas a week for accommodation in a large bedroom (6–8 beds) to 10 guineas for single bedrooms. "No extra charges are made for services, but residents are expected to provide their personal clothing and pocket money." A room can be booked by visitors making an overnight stay.

Inquiries should go to the secretary of the residential services department, National Association for Mental Health, 39, Queen Anne Street, London, W.1.

## EXTENSION TO A MENTAL HOSPITAL

SOME five hundred people attended the opening, on Oct. 8, of a 44-bed admission block at Moorhaven Hospital, Ivybridge, South Devon. This mental hospital, which with smaller hospitals in its group is responsible for the mental health service in the Plymouth clinical area, is (like other mental hospitals) troubled by overcrowding; and one effect has been that new patients have had to be received and treated in wards which also accommodated long-stay patients who were physically sick or infirm. In the new block patients can be received and treated apart from the main hospital. The new building, of one storey, can accommodate 20 male and 24 female patients in wards connected by a large common-room for both sexes. It has been named the Marshall Clinic, after Mrs. J. Marshall, who is serving her 30th consecutive year on the management committee and has been chairman since 1948.

## DEFENCE AGAINST INSECTS

THE film unit of the Shell Petroleum Company Ltd., has made *The Rival World*, a film emphasising the threat to human life and food-supplies from members of the insect world, which comprises four-fifths of the Animal Kingdom, and outnumbers man by fifty million to one.

The production is of a high standard. The film illustrates, in colour, both victims and vectors of malaria, elephantiasis, trypanosomiasis, and trachoma; but much of it deals with the destruction of the insect legions which damage crops. "To half the men who die, death is brought by insects: of all the food we grow, one-third is taken by insects. It is a toll which mankind cannot afford." We are shown insecticides (made from petroleum by-products) being sprayed on crops and on anopheles-infested water, and one sequence records an attack on a flying swarm of locusts by aircraft using sprays.

The World Health Organisation, and the Food and Agricultural Organisation of the United Nations have done much; but the film concludes that man must organise all his resources to counter "the greatest single threat to man's health and to his harvest."

The film, which runs for 25 minutes, is available, free of charge, for showing to appropriate audiences. In England application should be made to the Petroleum Films Bureau, 29, New Bond Street, London, W.1, and in Scotland to the Scottish Films Office, 16, Woodside Terrace, Glasgow, C.3.

## CRASH HELMETS

REMARKS by coroners have cast doubt on the efficacy of protective hats for motor-bicyclists made according to the requirements of British Standard 2001.[1] Last week at a meeting of experts called by the British Standards Institution it was remarked that before 1953 (when the standard was issued) the proportion of motor-bicyclists killed was 28 per 1000 injured; in 1955, it was 24. This meant that about a hundred lives were saved in 1954; and, it was claimed, there could be little doubt that much of this saving was due to the wearing of protective hats. Since the standard had been set in 1953 research had continued, mainly at the Road Research Laboratory.

## IMPRISONMENT

ALTHOUGH the prison and borstal population has fallen from the peak figure of 24,000 in 1952 to about 21,000 this year, overcrowding is still a problem in local prisons,[2] and the annual report of the Howard League for Penal Reform [3] says that "of all methods of penal treatment, imprisonment in the ordinary, local, closed prisons has made least progress." These prisons have had to bear the burden of overcrowding, lack of staff, and shortage of work for the prisoners, many of whom are first offenders serving periods of one week to a few months, and those on remand who might be found not guilty, or put on probation. On the other hand, they also harbour hardened criminals serving long sentences of preventive detention, and men who are "too far gone in crime" to be sent to open or regional training prisons; and the report adds "even if there were no other reasons, it is not surprising that in many local prisons the regime remains negative, the approach impersonal." Stress is laid on the importance of rehabilitating the first offender, and the League suggests a personal approach to each prisoner and his problems by the prison staff along the lines of the work done by probation officers.

The report points out that one out of every two prisoners receives a sentence of less than three months, and many of them periods of less than five weeks, which seems too short either for constructive training or as deterrents. In place of these short sentences, the League has suggested to the Home Secretary some alternative penal methods to help in relieving the pressure on local prisons.

A scheme of attachment of wages could be employed for the many civil prisoners, including those convicted in connec-

1. Northern Ireland General Health Services Board: Seventh Annual Report, 1954–55. H.M. Stationery Office. Pp. 31. 1s.
2. *Exeter Express and Echo*, Sept. 28, 1955.
3. *Sussex Daily News*, Sept. 23, 1955.

1. See *Lancet*, 1954, i, 1226.
2. *Lancet*, 1955, i, 102.
3. The Howard League for Penal Reform: annual report for 1954. 5s. From Parliament Mansions, Abbey Orchard Street, London, S.W.1.

tion with wife-maintenance and bastardy cases. This system at present operates in Scotland where "the mere threat of this power has reduced prison sentences in such cases virtually to zero, and there is the additional advantage that the woman actually receives the money due to her from her husband or the father of her child."

The system of attendance centres for juveniles might be suitably modified and extended to include certain types of adult first offenders, who would be able to live and earn normally during the day, but would be required to give up some of their spare time in the evenings and at the weekends to do useful work.

The number of young persons sent to prison has dropped considerably since petty-sessional courts have had to state in writing their reasons for imposing prison sentences on persons under 21 years of age. The League says that this system might be applied to all first offenders regardless of age.

Alternatives to prison sentences have also been suggested for alcoholics and the elderly, but the problem of the difficult offenders usually labelled "psychopaths" has yet to be tackled. In the coming year the League is to study the possibility of an experiment with an entirely new régime in one small local prison, based on individual case-work and group-work, family case-work, and intensive aftercare. "We believe," the report says, "that here, in the institutional treatment of offenders, great tasks lie ahead and that the real obstacles to penal reform will lie not so much in out-of-date buildings or inadequate amenities but in the intransigent attitude and difficult relationship of man to man."

In view of the difficulties which arise from the imprisonment of homosexuals, the League has recommended to the Departmental Committee that prison sentences should be imposed on homosexuals only as a last resort and should not exceed two years. It has put forward the view that sexual relations, voluntarily and in private, between male persons above the age of 21 should no longer be a legal offence, and that in every other respect homosexual offences should be dealt with as if they were heterosexual offences, save that sexual relations by a male above the age of 21 with a male below that age should remain an offence. Other proposals include the recommendation that everyone convicted of a homosexual offence and sent to prison, should have a diagnostic interview at or soon after reception. To cope with the increase of work and to secure some uniformity of procedure and a broadening of experience, "a closer relation between the Prison Medical Service and the National Health Service should be encouraged."

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### University of London

On Thursday, Nov. 3, at 5 P.M. at 1, Wimpole Street, London, W.1, Lord Adrian, O.M., F.R.S., will deliver the Semon lecture. His subject will be the Action of the Mammalian Olfactory Organ.

### University of Manchester

Lady Violet Bonham Carter, D.B.E., will give the Lloyd Roberts lecture on Friday, Nov. 18, at 5.15 P.M. at the university, when her subject will be Of Human Greatness.

### Scottish Conjoint Board

At recent examinations for the license of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, the following were successful:

Maeve C. F. Barrett, Hans Bor, Å. E. Dyrting, Bhim Singh Jain, Yee Kit Poon, J. D. Rosanelli, D. J. Solomon, Anton Wolf.

### Courses for General Practitioners at Cambridge

During 1955–56 symposia will be held on Saturdays on the following subjects: obstetrics and gynæcology (Oct. 22), hæmatology (Nov. 12), dermatology (Dec. 3), psychotherapy (Jan. 14), cardiovascular diseases (Feb. 18), orthopædics (March 10), ear, nose, and throat, and eye diseases (April 14), pædiatrics (May 12), respiratory diseases (June 9), gastroenterology (July 7). Further information may be had from the secretary, Medical School, Tennis Court Road, Cambridge.

### Nutritional Requirements and Food Fortification

The first of a series of meetings on this subject will be held in the rooms of the Chemical Society, Burlington House, Piccadilly, London, W.1, on Wednesday, Oct. 26, at 6.30 P.M., when Mr. T. Moore, D.SC., Mr. V. H. Booth, PH.D., and Mr. P. N. Williams, F.R.I.C., will speak on vitamins A and D.

### Society of Apothecaries of London

The annual master's day service of this society will be held on Sunday, Oct. 23, at 11.15 A.M. at the Church of St. Mary, Aldermary.

### British Asthma Association

At a meeting of this association, to be held at the Wellcome Research Institute, Euston Road, London, N.W.1, on Thursday, Oct. 27, at 7 P.M., Dr. F. J. Prime will speak on Inhalation Therapy.

### Society for Cultural Relations with the U.S.S.R.

On Friday, Oct. 28, at 8 P.M., at 14, Kensington Square, London, W.8, the British doctors who visited Russia in August and September will speak on Soviet Preventive Medicine.

### Lady Tata Memorial Trust

Dr. David Galton, of the Chester Beatty Research Institute, Fulham Road, London, S.W.3, has been appointed secretary of the (European) scientific advisory committee of the trust, in succession to Dr. F. H. K. Green who has become scientific secretary of the Wellcome Trust.

### Hospital Administrative Staff College

Mr. P. H. Constable, M.A., F.H.A., has retired from the office of principal of this college of King Edward's Hospital Fund for London, which he has held since it opened in 1951. He remains associated with the college as chairman of the panel of advisers. Mr. R. A. Mickelwright, F.H.A., the vice-principal, has been appointed principal.

### Instead of National Service

At the suggestion of the Ministry of Education (*Times*, Oct. 7), Dudley town council has appointed a 23-year-old dentist to their school dental service at a salary of £900 a year rising to £1400. The dentist, as a conscientious objector, appealed against fulfilling his period of National Service and was put down for non-combatant duties.

### School for Spastics

On Thursday, Oct. 20, at 2.30 P.M., Mr. Wilfred Pickles will open the school at Tixover Grange, Rutland, which has been named after him. It is one of five which the society is opening this year and will take 60 spastic children as boarders and some local spastic children as day pupils. The staff will include three physiotherapists and two speech therapists.

### Naval Appointments

Surgeon Rear-Admiral R. C. May is to be promoted surgeon vice-admiral and appointed medical director-general of the Navy in succession to Surgeon Vice-Admiral Sir Alexander Ingleby-Mackenzie who retires at the end of April.

Surgeon Captain R. L. G. Proctor has been promoted surgeon rear-admiral and appointed deputy medical director-general of the Royal Navy in succession to Surgeon Rear-Admiral S. G. Ramsford.

### London Marriage Guidance Council

A course of lectures for doctors is to be held by the council at 7 P.M. on Thursdays, Nov. 3, 10, 17, and 24, at the National Association for Mental Health, 39, Queen Anne Street, London, W.1. The lecturers will be Dr. Sidney Bockner, Dr. J. F. Tuthill, Dr. J. F. Lovel Barnes, and Dr. P. M. Bloom. The fee for the course will be one guinea and further particulars may be had from the secretary of the council, 78, Duke Street, W.1.

### Osler's Oxford House

On Oct. 8 Prof. G. W. Pickering, the new regius professor of medicine, unveiled a plaque on the house in Norham Gardens in which Sir William Osler lived from 1904 to 1919. In 1928 the house was bequeathed to the university by Lady Osler as an official residence for professors. Professor Pickering is the first of Sir William's successors in the chair of medicine to live there. The house, which also has two flats for members of the faculty or for visiting lecturers, has been reopened largely through the efforts of the Osler Club of London.

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CORRIGENDUM: *Antibiotic-resistant Staphylococcal Infections.*—In his letter (Oct. 1, p. 725) we erroneously gave Dr. K. Zinnemann's address as the Department of *Medicine*, University of Leeds. Dr. Zinnemann wrote from the Department of Bacteriology.

# Diary of the Week

OCT. 16 TO 22

## Monday, 17th

UNIVERSITY COLLEGE, Gower Street, W.C.1
5.30 P.M. Prof. J. F. Danielli, D.SC.: Nuclear and Cytoplasmic Sites of Drug Action.

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, London, W.12
4 P.M. Dr. W. A. Briscoe: Why Do Respiratory Function Tests?

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel Street, W.C.1
5 P.M. Madame Alva Myrdal: The Interplay of Factors in the Development Process. (First of five Heath Clark lectures.)

INSTITUTE OF NEUROLOGY, Queen Square, W.C.1
5 P.M. Dr. Leonard Kurland (U.S.A.): The Etiologic Significance of Epidemiologic Research in Multiple Sclerosis and Amyotrophic Lateral Sclerosis.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (Chelsea Hospital for Women, S.W.3.) Mr. H. J. Fisher: Postoperative Electrolyte Balance.

HUNTERIAN SOCIETY
8.30 P.M. (Talbot Restaurant, London Wall, E.C.2.) Mr. A. Dickson Wright: How Patients Have Deceived Me. (Presidential address.)

UNIVERSITY OF EDINBURGH
5 P.M. (University New Buildings, Teviot Row.) Prof. R. A. McCance, F.R.S.: Chemical Structure of the Body. (Sharpey Schafer lecture.)

## Tuesday, 18th

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
3 P.M. Sir John Charles: The Contrivance of Collegiation. (Harveian oration.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. L. W. Proger: Pneumatosis. (Erasmus Wilson demonstration.)

THE LONDON HOSPITAL MEDICAL COLLEGE, E.1
5 P.M. Prof. L. J. Witts: Anæmia and the Alimentary Tract. (Schorstein lecture.)

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. Arthur Bell: Third Stage of Labour and Postpartum Hæmorrhage.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Dr. H. A. Burt: Minor Joint Complaints.

INSTITUTE OF NEUROLOGY
5.30 P.M. Dr. Macdonald Critchley: Psychological Aspects of Pain.

SOUTH WEST LONDON MEDICAL SOCIETY
8.30 P.M. (Bolingbroke Hospital.) Dr. Mary Wilmers: Allergic Diseases of Children.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
5 P.M. Prof. G. P. Crowden: Environmental Factors Affecting Comfort, Health and Working Capacity. (Bengué lecture.)

## Wednesday, 19th

UNIVERSITY COLLEGE
5.45 P.M. Dr. James V. Neel (Michigan): Genetic Control of Hæmoglobin Synthesis. (Galton lecture.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Comparative Medicine.* Prof. James McCunn: Liaison Between Two Professions with Similar Interests. (Presidential address.)
8.15 P.M. *General Practice.* Dr. R. J. Minnitt: A Surgeon and Seven Pieces of Old Silver. (Valedictory address.)

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Dr. J. D. N. Nabarro: Diabetes and Carbohydrate Metabolism. (First of two lectures.)

INSTITUTE OF DISEASES OF THE CHEST, Brompton Hospital, S.W.3
5 P.M. Mr. T. Holmes Sellors: Diaphragmatic Hernia.

EUGENICS SOCIETY
5.30 P.M. (Royal Society, Burlington House, Piccadilly, W.1.) Dr. J. F. Loutit: Biological Hazards of Nuclear Fission.

ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE, 48, Cosway Street, Marylebone Road, N.W.1
5.30 P.M. Dr. E. H. Larkin: Major Psychiatric Syndromes.

HYPNOTHERAPY GROUP
8 P.M. (1, Wimpole Street, W.1.) Dr. A. G. Davies: Scope and Limitations of Hypnotherapy.

MIDLAND MEDICAL SOCIETY
8.15 P.M. (Midland Hotel.) Sir Ernest Finch: Leonardo da Vinci.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY, 64, St. James's Street, Nottingham
8.30 P.M. Dr. H. J. Parish: Recent Trends in Preventive Inoculation.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH, Edinburgh, 8
3.30 P.M. Sir Clement Price Thomas: Conservative Resection of the Bronchial Tree.

## Thursday, 20th

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland Place, W.1
7.30 P.M. Prof. R. M. Gordon: The Host-parasite Relationship in Filariasis. (Presidential address.)

WEST LONDON MEDICO-CHIRURGICAL SOCIETY
9 P.M. (Fellows' Restaurant, Zoological Gardens.) G. B. Woodd Walker: Man Alive. (Presidential address.)

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1
8 P.M.: Mr. E. Cotchin, M.R.C.V.S.: Neoplasia in Domesticated Mammals.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, 3
8 P.M. Mr. Ronald Edwards, Prof. Charles Wells: Hiatus Hernia.

MANCHESTER MEDICAL SOCIETY
8 P.M. *Anæsthetics.* Dr. J. McAuley: Two Schools of Thought. (Presidential address.)

UNIVERSITY OF ST. ANDREWS
5 P.M. (Queen's College, Small's Wynd, Dundee.) Professor McCance: Metabolism and Renal Function in the First Two Days of Life.

## Friday, 21st

UNIVERSITY COLLEGE
5 P.M. Dr. R. W. Sperry (California): Neural Mechanisms Underlying Perception.

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Mr. Sol Cohen: Limb Gangrene.
4 P.M. Prof. W. D. M. Paton: Application of Synaptic Pharmacology to Clinical Practice.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Mr. William McKenzie: Tonsil and Adenoid Problem.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (Hammersmith Hospital.) Prof. R. J. Kellar: Placental Dysfunction.

ROYAL SOCIETY OF MEDICINE
5 P.M. *Epidemiology and Preventive Medicine.* Dr. J. C. McDonald, Miss Ruth E. Charter: *B. coli* sero-types in a Nursery. Dr. J. G. Holmes: Epidermophytosis in Miners.
8.15 P.M. *Radiology.* Dr. Drew Thomson, Dr. A. M. Jelliffe: Possible Significance of the Thymic Origin of Hodgkin's Disease.

FACULTY OF RADIOLOGISTS
5 P.M. (Royal College of Surgeons.) *Radiotherapy.* Dr. E. F. Scowen: Indications for the Ablation of Endocrine Activity in the Ovaries, Adrenals, and Anterior Pituitary in the Treatment of Breast Cancer.

SIGERIST SOCIETY
7.30 P.M. (45, Russell Square, W.C.1.) Dr. Brian Kirman: The Problem of the Backward Child.

WEST MIDLANDS PHYSICIANS ASSOCIATION
11 A.M. (Queen Elizabeth Hospital, Birmingham, 15.) Autumn meeting.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. (Royal College of Surgeons, 18, Nicolson Street.) Mr. R. B. Wright, Dr. R. W. D. Turner: Assessment of Fitness for Operation in the Elderly. (Joint meeting with the Royal Medico-Chirurgical Society of Glasgow.)

# Appointments

CROW, JOHN . . .P.E., D.A.: whole-time asst. anæsthetist (S.H.M.O.), based at . . .e Inverness hospitals.

DODDS, R. J., M.B. Durh., D.P.H.: M.O.H. and principal school M.O., Smethwick.

GEORGE, J. T. A., M.D. Birm., D.P.H.: deputy county M.O., Yorks.

MILLAR, I. B., M.D. Belf., D.P.H.: M.O.H., Welshpool, Montgomery, and Llanfyllin boroughs.

O'MALLEY, A. G., M.CH. ORTH. Lpool, F.R.C.S.E.: consultant orthopædic surgeon, Royal Southern Hospital, Liverpool.

PIERCE, H. L., M.B. Camb.: appointed factory doctor, Keighley, Yorks.

SCADDING, F. H., M.D. Lond., F.R.C.P.: asst. consultant physician, Brompton Hospital, London.

**Birmingham Regional Hospital Board:**

ALEXANDER, M. K., M.B. Lpool, D.PATH.: whole-time consultant pathologist, South Warwickshire group.

DOLTON, E. G., F.R.C.S.: part-time consultant thoracic surgeon, Dudley, Stourbridge and Lichfield, Sutton Coldfield and Tamworth groups.

GRAY, I. R., M.D. Lond.: part-time consultant physician, Coventry group.

JACOBS, PHILIP, M.B. Brist., D.M.R.D.: part-time consultant radiologist, Birmingham (Selly Oak) group.

MARSHALL, A. T., F.R.C.S.E.: part-time consultant obstetrician and gynæcologist, South Worcestershire group.

RICHARDS, D. G., M.D. Birm.: part-time consultant physician: Walsall and West Bromwich groups.

THORN, P. A., M.D. Lond.: part-time consultant physician, Wolverhampton group.

WALKDEN, W. J., M.B. Birm.: whole-time consultant in gerontology and medicine, West Bromwich, Dudley and Stourbridge groups.

# Births, Marriages, and Deaths

## MARRIAGES

FLYNN—WARRICK.—On Sept. 24, at St. John's, Blackheath, Frederick Flynn, M.D., to Ann Warrick, M.B., D.C.H.

O'REILLY—DALEY.—On Oct. 8, at Wimbledon, J. N. O'Reilly, M.R.C.P., to Doreen Daley, F.R.C.O.G., daughter of Sir Allen Daley, F.R.C.P., and Lady Daley.

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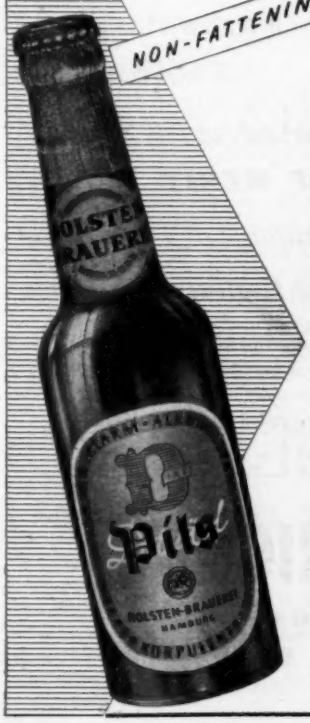


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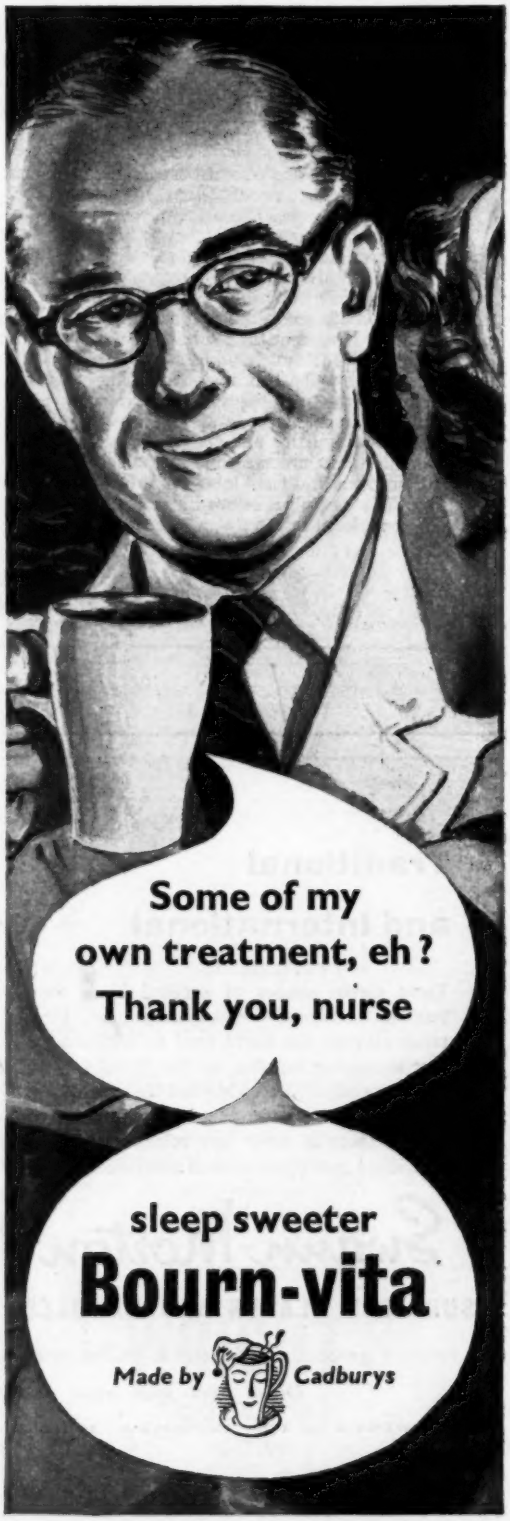

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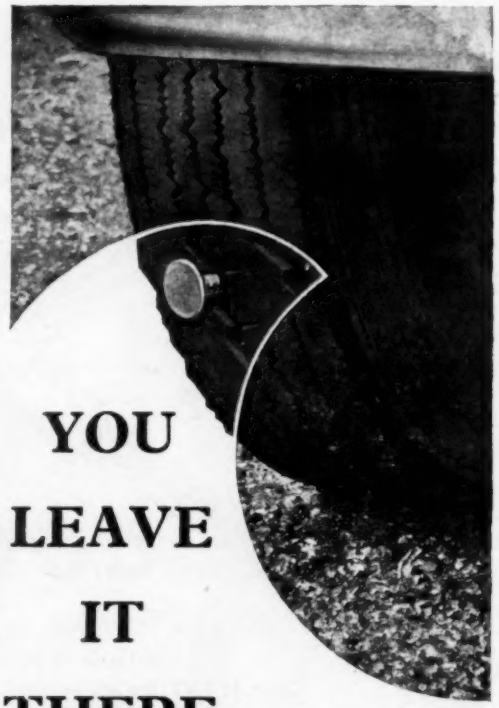

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At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

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This Hospital receives all types of patients who are suffering from psychological and senile illnesses. It has recently been extensively re-decorated and central heating has been installed throughout, making it one of the most luxuriously appointed hospitals in the country. Private rooms, with special nurses, can be provided. All patients receive very careful and thorough clinical and pathological investigations; the most modern psychiatric treatment is available, including deep insulin therapy. Psychotherapeutic treatment is employed in suitable cases.

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## Academic and Educational

### UNIVERSITY OF LONDON
INSTITUTE OF ORTHOPÆDICS

COURSE IN NEUROLOGY IN ORTHOPÆDICS
28TH NOVEMBER–2ND DECEMBER, 1955

Monday, 28th November—Town Section
Electrical examination in neuro-muscular disorders .. Mr. D. M. BROOKS
Spina bifida .. .. .. .. Mr. J. I. P. JAMES
Some deformities associated with neurological disorders (1) .. Dr. P. H. SANDIFER
Mr. J. I. P. JAMES
Pathology of poliomyelitis .. .. Dr. H. A. SISSONS
Tuesday, 29th November—Town Section
Some deformities associated with neurological disorders (2) .. Dr. P. H. SANDIFER
Traumatic paraplegia .. .. .. Dr. L. GUTTMANN
Cerebral palsies of infancy (1) .. .. Dr. P. H. SANDIFER
Wednesday, 30th November—Town Section
Pathology of muscle .. .. .. Dr. H. A. SISSONS
Cervical disc lesions .. .. .. Mr. H. O. CLARKE
Cerebral palsies of infancy (2) .. .. Dr. P. H. SANDIFER
Nerve injuries at the wrist .. .. Mr. H. J. SEDDON
Pathology and diagnosis of inter-vertebral disc lesions .. Mr. H. J BURROWS.
Thursday, 1st December—Country Section
Poliomyelitis—early treatment .. Mr. D. M. BROOKS
Surgery of spastic paralysis .. .. Mr. K. I. NISSEN
Compression paraplegia .. .. .. Mr. V. LOGUE
Friday, 2nd December—Country Section
Poliomyelitis—late treatment .. .. Mr. J. A. CHOLMELEY
Clinical demonstration .. .. .. Mr. D. TREVOR
Nerve injuries complicating fractures .. Mr. H. J. SEDDON

The fee for this course (including lunch and tea) is 7 guineas. Early application should be made to the Dean, at 234, Great Portland-street, London, W.1.

### THE LONDON HOSPITAL MEDICAL COLLEGE

COURSE IN ADVANCED MEDICINE

A Postgraduate Course in Medicine will be held at The London Hospital, commencing MONDAY, 9TH JANUARY, and finishing FRIDAY, 16TH MARCH, 1956. Classes will be held on Mondays, Wednesdays, and Fridays. The course will be limited to 24 students.

Applications should be made to the Dean. The fee for the whole course will be 35 guineas, and for Old Londoners 15 guineas.

H. B. MAY, M.A., M.D., F.R.C.P., Dean.

Turner-street, London, E.1.

### THE MIDDLESEX HOSPITAL MEDICAL SCHOOL

LEVERHULME RESEARCH SCHOLARSHIP IN CLINICAL MEDICINE

Applications are invited for a Leverhulme Research Scholarship, value £1000 p.a. plus superannuation. The Scholarship shall be for 1 year in the first instance. The Scholar must satisfy the Middlesex Hospital Medical School that the major part of his time will be spent in research, but he may be allowed to hold other appointments. The work may be related to any branch of medicine, must be essentially clinical and will be carried out in the Institute of Clinical Research attached to the Middlesex Hospital Medical School.

Applications, with the names of 2 referees and a summary of the proposed work, should reach the Secretary of the Institute of Clinical Research, The Middlesex Hospital Medical School, 40, Hanson-street, London, W.1, not later than 31st October, 1955.

### UNIVERSITY COLLEGE LONDON
(Gower-street, W.C.1)

Prof. F. B. STRAUB (Budapest) will give 2 PUBLIC LECTURES on 24TH and 27TH OCTOBER at 5 P.M. : (1) Synthesis of Amylase in cell-free systems ; (2) Mechanism of active transport of potassium in the human erythrocyte.

Admission free, without ticket.

E. A. L. GUETERBOCK, Secretary.

### THE ROYAL SOCIETY

GOVERNMENT GRANT FOR SCIENTIFIC INVESTIGATIONS

Applications for grants from the third allotment of the Government Grant for Scientific Investigations for the year 1955 should be made as soon as possible on forms of application to be obtained from the Assistant Secretary of the Royal Society, Burlington House, London, W.1. No application can be considered which is received later than 20TH NOVEMBER, 1955.

Applicants must be of British nationality, resident in Great Britain or Northern Ireland. Grants may be made for purposes in connection with the promotion and support of research in pure science other than for personal maintenance or payment of stipends ; for the assistance of scientific expeditions and collections ; but not in aid of scientific publications.

**DUNFERMLINE COLLEGE OF PHYSICAL EDUCATION, ABERDEEN.** Applications are invited from Women for the post of MEDICAL OFFICER AND PRINCIPAL LECTURER IN ANATOMY, PHYSIOLOGY AND HEALTH EDUCATION ; ability to lecture in psychology a recommendation. The duties of the medical officer include the routine medical examination of women in training and candidates before entrance, but not ordinary medical attendance. The salary is on the scale £1050–£50–£1250, with placing according to qualifications and experience. The post will be vacant in January, 1956.

Application forms and conditions of appointment may be obtained from the Principal, Dunfermline College of Physical Education, Woolmanhill, Aberdeen, to whom the completed form with letter of application, stating qualifications in detail, should be sent as soon as possible and not later than Tuesday, 1st November, 1955.

### BRITISH ASTHMA ASSOCIATION

Dr. F. J. PRIME, M.D., Senior Lecturer, Department of Physiology, Institute of Diseases of the Chest, Brompton, will lecture on "Some Aspects of Inhalation Therapy" at the Wellcome Research Institution Hall, Euston-road, on THURSDAY, 27TH OCTOBER, at 7 P.M.

Visitors welcomed by the British Asthma Association.

**THE UNIVERSITY OF MANCHESTER.** Applications are invited from candidates with medical qualifications registrable in this country for the post of LECTURER or ASSISTANT LECTURER IN ANATOMY. Good research facilities available. Salary scales p.a. ; Lecturer £1000–£1800 ; Assistant Lecturer, £700–£1100, with membership of F.S.S.U. and children's allowance scheme ; initial salary and status according to qualifications and experience. The successful candidate will be expected to take up his duties as soon as possible.

Applications should be sent, not later than 7th November, 1955, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained. Overseas applicants should send letters of application giving details of qualifications and experience, and should submit the names of at least 2 persons to whom reference may be made.

## Hospital Services : Senior Appointments

**CARDIFF. THE UNITED CARDIFF HOSPITALS.** The Board of Governors invites applications for the appointment of Whole-time CONSULTANT RADIOLOGIST to carry out all the duties of the Department of Radiology, including neuro-radiology. The Department is a recognised school for the D.M.R.(D.) and for the M.S.R. and the successful candidate will be required to take part in the teaching.

Applications, with the names of 3 referees, should be sent to the Secretary, United Cardiff Hospitals, Cardiff Royal Infirmary, Newport-road, Cardiff, within 14 days of the publication of this advertisement.

**HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL.** Whole-time Locum ANÆSTHETIST (Senior Hospital Medical Officer) required 2nd–13th December (inclusive) with possible extension to 20th December. ss

Applications should be sent to the Hospital Secretary as soon as possible.

**LEEDS REGIONAL HOSPITAL BOARD. Part-time** Locum CONSULTANT RADIOLOGIST (9 sessions) for duties at hospitals in the Bradford A Group. Appointment will be for a minimum period of 18 months.

Applications, stating age, qualifications, and experience, together with the names and addressess of 3 referees, to the Secretary, Park-parade, Harrogate, by 21st October, 1955.

**NEWCASTLE REGIONAL HOSPITAL BOARD. SUNDERLAND AREA HOSPITAL MANAGEMENT COMMITTEE.** (Main geriatric beds ; Sunderland General 270 ; Ryhope General 96 ; Leeholme 171.) ASSISTANT PHYSICIAN (geriatrics), Senior Hospital Medical Officer status, whole-time or part-time for minimum of 9 notional half-days per week. Higher qualification desirable.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

**NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.**

(1) CONSULTANT PATHOLOGIST (whole-time or maximum sessions), Hitchin hospitals (total beds approximately 560). Duties, mainly hæmatology and bacteriology, based on the Lister Hospital.

Applications by 21st November, 1955.

(2) ASSISTANT CHEST PHYSICIAN (whole-time), Senior Hospital Medical Officer grade, Luton Chest Clinic, Grove-road, Luton. Associated with the clinic is a subsidiary clinic at the Lister Hospital, Hitchin, and 33 Beds in St. Mary's Hospital, Luton. Candidates should have good general medical experience and special experience in treatment of tuberculosis and diseases of the chest.

Applications by 23rd November, 1955.

Hospital and Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

**SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD.** Applications are invited for the post of DEPUTY MEDICAL SUPERINTENDENT of the Inverness Group of hospitals. Salary scale is £1133 6s. 8d.–£50 (2)–£66 13s. 4d.–£1300 p.a. Married quarters and catering services are available at Raigmore Hospital.

Schedules of application and further particulars of the post are obtainable from the undersigned, with whom applications should be lodged by 29th October, 1955.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

**SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the following appointments :

Whole-time CONSULTANT PATHOLOGIST at Stobhill Hospital, with associated duties at Foresthall Hospital, Glasgow.

Whole-time ASSISTANT ORTHOPÆDIC SURGEON based at the Royal Infirmary, Glasgow, with duties at Law Hospital, Carluke. Salary (at age 32 and over) on the scale £1500–£50–£1950.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

**SHEFFIELD REGIONAL HOSPITAL BOARD.** Whole-time ASSISTANT PATHOLOGIST required General Hospital, Nottingham. The successful candidate will work under the supervision of the Pathologist-in-charge of the Department. Applicants should have general all-round experience in clinical pathology, but a special interest in haematology is desirable. A higher medical qualification will be an advantage. Salary scale £1500–£50–£1950.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 15th November, 1955.

**WARE, HERTFORDSHIRE. WARE PARK HOSPITAL** (129 tuberculosis beds.) Locum SENIOR HOSPITAL MEDICAL OFFICER (Chest Physician) required for period 19th February, 1956–13th May, 1956. Resident.

Applications, with names of referees, to Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts (Tel.: Hertford 2275).

**WELSH REGIONAL HOSPITAL BOARD.** Whole-time SENIOR CASUALTY OFFICER, based at East Glamorgan Hospital, Church Village, near Pontypridd, to serve other hospitals in Group. Appointment under general supervision of Visiting Orthopædic Consultants. Preference given to candidates with experience of traumatic conditions. Salary within range of £1500–£1950. Tenure of appointment for a period not exceeding 4 years.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

**WELSH REGIONAL HOSPITAL BOARD.** Whole-time Locum Tenens CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST required Pontypridd and Rhondda area immediately.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

**WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE.** Locum SENIOR HOSPITAL MEDICAL OFFICER in Chest Diseases (Male or Female). Urgently required for at least 3 months. Resident or non-resident post. Previous experience in chest work desirable.

Applications to Secretary, Knowsley House, Wigan.

**NEW ZEALAND. DANNEVIRKE HOSPITAL BOARD.** Applications are invited from registered medical practitioners for the position of MEDICAL SUPERINTENDENT of Dannevirke Hospital, Hawkes Bay, New Zealand. Salary scale £NZ1440–£NZ1690, an unfurnished house, fuel and light will be provided at the value stated in the Hospital Employment Regulations, 1952. Should overseas appointment be made, monetary assistance towards payment of fare is available for the appointee, his wife and dependent children.

Further information of the position available on application to the High Commissioner for New Zealand, 415, Strand, London, W.C.2, with whom applications close on 24th October, 1955.

**NEW ZEALAND. NORTHLAND HOSPITAL BOARD, WHANGAREI, NEW ZEALAND.** Applications are invited from qualified medical practitioners for the position of Part-time VISITING E.N.T. SPECIALIST.

Conditions of appointment available from the High Commissioner, New Zealand House, London, or the Secretary, Northland Hospital Board, P.O. Box 403, Whangarei, New Zealand, with whom applications close on 1st December, 1955.

**U.S.A. VIRGINIA. Progressive state mental hospital** (4600 Beds) in Virginia, expanding staff, invites applications for PHYSICIANS at all levels, psychiatric experience desirable but not necessary. Salary from $8040 (approximately £2750). All modern methods of treatments. Opportunities for research. Good retirement plan.

Apply to BRIAN C. CAMPDEN-MAIN, M.R.C.S. Send full résumé in first letter. Box 271, Petersburg, Virginia, U.S.A.

## Hospital Services : Junior Appointments

**BATTERSEA GENERAL HOSPITAL, S.W.11.** House PHYSICIAN (residence optional), vacant 1st November, 1955. Not pre-registration.

Apply Hospital Secretary, enclosing copies of 2 recent testimonials.

**BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11.** CASUALTY OFFICER (residence optional). House Officer or Senior House Officer grade according to experience. Vacant immediately; not pre-registration.

Apply Hospital Secretary enclosing 2 copies of recent testimonials.

**CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10.** (726 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR required in X-ray Department at above Hospital. Whole-time, non-resident. Will include teaching. Diploma in Radiology essential. Applicants may visit Hospital by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 25th October, 1955.

**CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10.** Pre-registration RESIDENT HOUSE OFFICER required in Obstetrics and Gynæcological Department. Post approved for D.Obst.R.C.O.G. and M.R.C.O.G. examinations. Pre-registration candidates only will be considered. Appointment for 6 months from 18th November, 1955.

Applications to Medical Director, with copies of 2 testimonials, by 22nd October, 1955.

**CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10.** RESIDENT HOUSE OFFICER required in General Medical and Neurological Department. Appointment for 6 months from 9th November, 1955.

Applications to Medical Director, with copies of 2 testimonials, by 22nd October, 1955.

**BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL.** Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER, commencing on 1st January, 1956, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Applicants should intend to take a full training in psychiatry. Experience in general medicine and neurology or in the basic sciences is an advantage.

Applications, giving details of experience and the names of 2 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark-hill, London, S.E.5.

**BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL.** Applications are invited from registered medical practitioners for the appointment of SENIOR REGISTRAR (first year), commencing on 1st January, 1956, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Candidates should have a higher medical qualification, and experience in psychiatry is essential.

Applications, giving details of experience and the names of 2 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark-hill, London, S.E.5.

**BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL.** Applications are invited from registered medical practitioners for the appointment of REGISTRAR, commencing on 1st January, 1956, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Candidates with experience in general medicine and neurology or in psychology will receive special consideration.

Applications, giving details of experience and the names of 2 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark-hill, London, S.E.5.

**BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11.** HOUSE SURGEON (resident), vacant 18th November. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 25th October, 1955.

**CHARING CROSS HOSPITAL.** Full-time Non-resident PÆDIATRIC REGISTRAR (grade: Registrar or Senior Registrar, to be decided). Tenable from 19th December, 1955, for 1 year in the first instance, with eligibility for re-election. Candidates should have had experience in pædiatrics and preference will be given to those holding the M.R.C.P. The Registrar's duties will include work in the Pædiatric Departments of Charing Cross, Harrow, Kingsbury, Wembley and Mount Vernon Hospitals.

Application forms, obtainable from the undersigned, should be returned by 31st October, 1955.

FRANK HART, Secretary to the Board.

Charing Cross Hospital, London, W.C.2.

**CONNAUGHT HOSPITAL, Walthamstow, E.17.** (118 Beds.) HOUSE SURGEON required for 6 months (General Surgery and Special Departments). Post vacant 16th November, 1955. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

**DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10.** HOUSE PHYSICIAN (pre-registration) required on 31st October.

Applications, stating age, nationality, qualifications and experience, with 3 recent testimonials, should be sent to the undersigned on or before 24th October.

F. A. LYON, Secretary.

**FOREST GATE HOSPITAL, Forest-lane, E.7.** Pre-registration OBSTETRIC HOUSE OFFICER (second post) required for 6 months commencing 1st December, 1955. The appointment is recognised for training of candidates for D.Obst.R.C.O.G.

Applications, with names of 2 referees, to the Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, by 22nd October, 1955.

**GUY'S MAUDSLEY NEUROSURGICAL UNIT.** Applications are invited for the post of SENIOR HOUSE OFFICER for 6 months commencing 1st December, 1955. The unit, which is housed in the Maudsley Hospital, serves Guy's Hospital, and the Bethlem Royal Hospital and the Maudsley Hospital.

Applications should be made within 7 days of the appearance of this advertisement, to—

K. J. JOHNSON, House Governor and Secretary.

Maudsley Hospital, Denmark-hill, S.E.5.

**KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.5.** Applications are invited for the post of REGISTRAR to the Radiotherapy Department. The appointment is a full-time one and is tenable immediately, and will be for 1 year in the first instance.

Applications, giving details of age, education, qualifications and experience, should be submitted to the House Governor to reach him not later than 29th October, 1955.

S. W. BARNES, House Governor.

**HACKNEY HOSPITAL, London, E.9.** (General—841 Beds.) Applications (registered medical practitioners only) for the following House Officer posts:—

(*a*) CASUALTY OFFICER AND HOUSE PHYSICIAN (Skin Department), vacant 11th November;

(*b*) CASUALTY OFFICER AND HOUSE SURGEON (E.N.T. Department), vacant 25th November;

should reach Group Secretary, above address, as soon as possible, stating if for post (*a*) or (*b*).

**HACKNEY GROUP HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the 12 months appointment of RESIDENT SENIOR HOUSE OFFICER (anæsthetics) from 1st October. Duties shared between German Hospital (General—157 Beds) and the Mothers' Hospital (Salvation Army) (Maternity—110 Beds) with residence at German Hospital. The post offers experience in general surgical anæsthesia in the Group and facilities are provided to study for higher examinations.

Apply, with testimonials, to Group Secretary, Hackney Hospital, London, E.9, quoting GMH/SHO.

**LAMBETH HOSPITAL, Brook-drive, S.E.11. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** Applications are invited for the appointment of part-time OPHTHALMIC REGISTRAR (6 sessions per week) for duties in the Ophthalmic Unit which is linked with the Royal Eye Hospital. The appointment is for 2 years, but is subject to review at the end of the first year.

For form of application apply (enclosing stamped addressed envelope) to the Secretary, to whom completed forms should be returned not later than 29th October, 1955.

**LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST.** 2 vacancies occur 1st December, 1955, for RESIDENT HOUSE PHYSICIAN, appointment for 6 months, 4 in London, 2 at the Country Branch near Letchworth, and posts graded as House Officer. Duties include work in the Outpatients Department and refill clinic as well as in wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held with copies of 3 testimonials should reach the undersigned not later than 29th October, 1955.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

**NATIONAL HOSPITALS FOR NERVOUS DISEASES.** Applications are invited from registered medical practitioners for the appointment of 2 REGISTRARS (non-resident) at The National Hospital, Queen-square, W.C.1, chiefly for work in the Outpatients Department. These posts carry the grade of Registrar. The appointments will be for 1 year in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 29th October, 1955.

H. EWART MITCHELL, Secretary to the Board of Governors.

The National Hospital, Queen-square, W.C.1.

**NORTH MIDDLESEX HOSPITAL, Edmonton, N.18.** 2 RESIDENT HOUSE PHYSICIANS (post-registration) required for 1st December, for 6 months. General medicine.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 24th October.

**NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.**

MEDICAL REGISTRAR (resident or non-resident, sleeping in on duty), Wanstead Hospital, Wanstead, E.11.

MEDICAL REGISTRAR (resident or non-resident, sleeping in on duty), Hackney Hospital, London, E.9.

REGISTRAR in Obstetrics and Gynæcology (resident), Hackney Hospital, London, E.9. Recognised for M.R.C.O.G. Post tenable for 1 year with possible extension to March, 1957.

REGISTRAR in Obstetrics and Gynæcology (non-resident), Prince of Wales's General Hospital, N.15, and Bearsted Memorial Hospital.

REGISTRAR in Pathology (resident), St. Ann's General Hospital, Tottenham, N.15.

SURGICAL REGISTRAR (resident), Essex County Hospital, Colchester, Essex. Recognised for F.R.C.S.

SURGICAL REGISTRAR (resident or non-resident, sleeping in on duty), Bethnal Green Hospital, London, E.2. Recognised for F.R.C.S.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 29th October, 1955.

**QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE,** Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICERS (2). These appointments will be made for 2 consecutive periods of 6 months commencing 1st December, 1955. First appointment as House Physician and second as House Surgeon and Casualty Officer in each case.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned, with copies of not more than 3 testimonials, on or before 29th October, 1955.

**ROYAL FREE HOSPITAL GROUP. Applications are** invited for the post of RESIDENT SENIOR HOUSE OFFICER to the Radiotherapy Department. Applicants should be registered medical practitioners, and the appointment is suitable for a candidate doing a postgraduate course in radiotherapy. The appointment is for 1 year in the first instance. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, London, W.C.1, to whom they should be returned not later than 31st October, 1955.

**SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN,** Clapham Common, S.W.4. Applications are invited from registered medical Women for the post of SENIOR HOUSE OFFICER in Pathology. Previous experience in laboratory work is not essential. Applicants will be required to live near the Hospital.

For form of application apply to the Secretary.

**SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN,** Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of HOUSE SURGEON, vacant 27th October, 1955, for a period of 6 months, recognised for F.R.C.S.

Form of application from the Secretary.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.** Applications are invited for an appointment as Whole-time REGISTRAR in General Medicine to fill a vacancy in the approved trainee establishment at the Woolwich Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 29th October, 1955.

**ST. ALFEGE'S HOSPITAL, Greenwich, S.E.10.** (373 Beds. Recognised for M.R.C.O.G. examination.) HOUSE OFFICER (obstetrics and gynæcology), vacant end-October. 6 months appointment (renewable). Salary £425–£525 p.a., less £125 p.a. for residence.

Applications and testimonials to Secretary, Greenwich and Deptford Hospital Management Committee, at above Hospital.

**ST. JAMES' HOSPITAL, Balham, S.W.12. House Physician** required at above Hospital.

Applications, stating age, qualifications, experience, and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, immediately.

**ST. MARY ABBOTS HOSPITAL, Marloes-road, Kensington,** W.8. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment to the Urology Department of a REGISTRAR (part-time), 5 sessions a week.

Applications (5 copies to be completed) to be submitted by 28th October, 1955, on forms obtainable from the Group Secretary (L.164), 5, Collingham-gardens, London, S.W.5.

**ST. MARY'S HOSPITAL, W.2. Applications are invited** for the post of Whole-time REGISTRAR in the Allergy Clinics (Wright-Fleming Institute of Microbiology). Preference will be given to candidates with previous experience in this specialty. The appointment is for a first period of 12 months as from 1st January, 1956; remuneration to be at Registrar rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 26th October, 1955.

**ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. Senior** HOUSE OFFICER (Casualty Department), vacant early December. Recognised for F.R.C.S. 6 months resident appointment and may be renewed for a further period. Salary £745 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

**ST. OLAVE'S HOSPITAL, Lower-road, S.E.16. Bermondsey AND SOUTHWARK HOSPITAL MANAGEMENT COMMITTEE.** HOUSE PHYSICIANS. 2 vacancies will occur on 1st January, 1956, at above Hospital.

Applications, with full details and names of 2 referees, to Secretary by 31st October.

**ST. THOMAS'S HOSPITAL, London, S.E.1. Obstetric** HOUSE PHYSICIAN at the General Lying-in Hospital, York-road, S.E.1, for 6 months from 1st January, 1956. Approved service for M.R.C.O.G.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 5th November.

**WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP.** Applications are invited from fully registered medical practitioners for the post of HOUSE SURGEON in the Orthopædic Department at above Hospital. This post, which is at present vacant, is recognised for the F.R.C.S.

Application forms from the Hospital Secretary, to whom they should be returned as soon as possible.

**WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP.** Applications are invited for the post of Pre-registration HOUSE SURGEON to the Gynæcology and Urology Departments at above Hospital, which falls vacant on 6th December, 1955.

Application forms from the Hospital Secretary to be returned by 27th October, 1955.

**WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP.** Applications are invited for the post of HOUSE SURGEON (pre-registration) in the Orthopædic Department at above Hospital, which falls vacant on 7th December, 1955. This post is recognised for the F.R.C.S.

Application forms from the Hospital Secretary to be returned by 27th October, 1955.

**ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT.** Applications are invited for the post of SENIOR HOUSE OFFICER in Orthopædics at the Aberdeen Royal Infirmary. The post is non-resident and applicants should have previous experience in general surgery.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

**ARLESEY, BEDFORDSHIRE. THREE COUNTIES HOSPITAL (Mental).** Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident). Salary £775–£1075 according to experience and qualifications. The Hospital (1300 Beds) which carries out all forms of treatment and provides facilities for research work, is conveniently situated, enabling Medical Officers to attend D.P.M. and other courses in London. Some 900 patients are admitted yearly (85% voluntary). Outpatient clinics are held at the local General Hospitals.

Application forms to be returned by 22nd October, 1955, are available on request to the Medical Superintendent.

**BATH HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited from medical practitioners for the post of HOUSE SURGEON (gynæcology and obstetrics) to the Bath Group of hospitals. Post is recognised for Diploma of the R.C.O.G. and for pre-registration purposes. Post vacant approximately 4th December.

Applications, stating age, qualifications and experience, with 3 testimonials, should be forwarded to Group Secretary, Manor Hospital, Bath, by 26th October, 1955.

**BEBINGTON, CHESHIRE. CLATTERBRIDGE HOSPITAL.** (743 Beds.) CENTRAL WIRRAL GROUP. Resident Locum JUNIOR HOSPITAL MEDICAL OFFICER (orthopædics/casualties) required for period 1st–28th November, 1955.

Applications, with full particulars, to the Hospital Secretary as soon as possible.

**BEDFORD GENERAL HOSPITAL. (437 Beds.) Locum** CASUALTY OFFICER (Registrar grade) required middle October pending permanent appointment. Salary £17 10s. per week.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

**BEDFORD GENERAL HOSPITAL. (437 Beds.) Pre-**registration HOUSE SURGEON required for casualty and orthopædic duties.

Applications, stating age, nationality, qualifications, previous appointments (if any), together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

**BEDFORD GENERAL HOSPITAL. (437 Beds.) North** WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required for busy acute Orthopædic and Traumatic Department at above Hospital. Previous orthopædic experience desirable. Candidates may visit Hospital by appointment with the Group Secretary.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) HOUSE SURGEON (first, second, or third post), vacant shortly. General surgical duties, some orthopædics. Offering good opportunity for general experience in busy acute General Hospital. Married quarters available. Recognised for F.R.C.S. Approved pre-registration post. Fully qualified practitioners may apply.

Applications to Group Secretary.

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) HOUSE PHYSICIAN. House Officer or Senior House Officer grading according to experience. Pre-registration post but fully qualified practitioners may apply.

Applications to Group Secretary.

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply to Group Secretary.

**BEXHILL-ON-SEA. BEXHILL HOSPITAL. (62 Beds.)** HOUSE SURGEON (resident), not pre-registration post. National scale of salary.

Apply to Hospital Administrator.

**BISHOP'S STORTFORD AND DISTRICT HOSPITAL,** Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER. Appointment to commence as soon as possible. **Salary £745 p.a.**

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

**BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS.** THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. 2 RESIDENT GYNÆCOLOGICAL HOUSE SURGEONS required from 7th January, 1956. Posts recognised for M.R.C.O.G.

Application forms obtainable from the House Governor to be returned not later than 31st October, 1955.

**BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS.** THE QUEEN ELIZABETH HOSPITAL. Applications are invited for the post of CLINICAL PATHOLOGIST (Senior House Officer) in the Department of Clinical Pathology. This officer will act as 1 of 4 blood-bank officers in addition to routine work in the department, and will be required to undertake his/her turn in residential duties. Previous experience in clinical pathology is not essential, but applicants should have had hospital postgraduate experience. The appointment is tenable for 1 year.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him as soon as possible.

**BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS.** THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER to work in the Clinical Pathological Department, vacant 7th November, 1955, for 1 year. Applicants should have held resident appointments in a children's hospital or a children's department of a general hospital.

Forms of application may be obtained from the House Governor and should be returned by 29th October, 1955.

G. A. PHALP, Secretary to the Board of Governors.

**BIRMINGHAM REGIONAL HOSPITAL BOARD.**

**(1) Birmingham (Sanatoria) Group, Yardley Green Hospital, Birmingham, 9**

MEDICAL REGISTRAR (chest diseases, including tuberculosis), Romsey Hill Hospital (133 Beds including Tuberculosis/Diabetic Unit) and Birmingham Chest Clinic. Resident.

**(2) Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29**

(*a*) REGISTRAR (anæsthetics) for Selly Oak Hospital (1040 equipped beds). Resident/non-resident. Post recognised for F.F.A.R.C.S. and D.A.

(*b*) RESIDENT SURGICAL REGISTRAR for Birmingham Accident Hospital (215 Beds). Special experience available in treatment of shock, infection, and principles of plastic surgery in connection with Medical Research Council Burns Unit. Previous experience not essential. F.R.C.S. advantageous. LOCUM considered.

**(3) South Warwickshire Group, 50, Holly-walk, Leamington Spa**

REGISTRAR (anæsthetics), vacant December. Duties mainly at Warneford General Hospital (207 Beds). Experience specialty essential.

Application forms from Group Secretaries, to be returned before 31st October, 1955. Candidates may visit hospitals.

**BIRMINGHAM AND MIDLAND EYE HOSPITAL,** Church-street, BIRMINGHAM, 3. HOUSE SURGEON required. Appointment for 6 months, but renewable. Hospital carries resident staff of 5 and provides a 2-year course of instruction. Recognised for the D.O. (England) and F.R.C.S. (England) in Ophthalmology. Wide experience available in all branches, including surgery.

Detailed applications by 29th October to Secretary, Dudley Road Hospital, Birmingham, 18.

**BIRMINGHAM. SUMMERFIELD HOSPITAL,** Western-road, BIRMINGHAM, 18. JUNIOR HOSPITAL MEDICAL OFFICER required. Resident or non-resident. 1000 Beds for elderly and chronic sick and an active geriatric organisation. 4 Junior Hospital Medical Officers.

Applications, with copies of 3 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

**BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER (anæsthetics) required 22nd November, 1955, for duties throughout Group, mainly at Royal Infirmary, Blackburn. Residence at Queen's Park Hospital, Blackburn. Post recognised for D.A. and F.F.A.R.C.S.

Apply to Secretary of Committee, with names of 2 referees or copies of testimonials, Royal Infirmary, Blackburn.

**BLACKBURN. ROYAL INFIRMARY. (282 general beds.)** JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (casualty and orthopædics) required immediately. Junior Hospital Medical Officer post can be for any period of up to 4 years and is recognised for F.R.C.S.

Apply to Secretary, Blackburn and District Hospital Management Committee, Hospital Management Committee Office, Royal Infirmary, Blackburn.

**BODMIN, CORNWALL. ST. LAWRENCE'S (MENTAL) HOSPITAL.** Locum Tenens MEDICAL OFFICER required for a period of 3 weeks from 15th November, 1955. The salary is at the rate of £17 10s. per week.

Applications to be addressed to the Medical Superintendent.

**BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL.** Applications invited for the posts of HOUSE SURGEON and HOUSE PHYSICIAN. The successful applicant will serve 6 months as House Surgeon followed by 6 months as House Physician. First, second, third, or pre-registration posts. Surgical post includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Medical post includes duties in medical and pædiatric wards.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

**BRECHIN, ANGUS. STRACATHRO HOSPITAL.** Applications are invited from medical practitioners of 2 years standing for the post of SENIOR HOUSE OFFICER to the area Geriatric Units at Stracathro Hospital and Brechin Infirmary. The Unit, comprising some 140 Beds, undertakes active treatment and rehabilitation under the direction of the Regional Consultant in Geriatrics. Salary scale £745 p.a., less £150 for residential emoluments. The post will become vacant about mid-November.

Applications, accompanied by 3 recent testimonials or naming 3 referees, should be addressed to the Group Medical Superintendent at Stracathro Hospital.

**BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE.** FRENCHAY HOSPITAL. (513 Beds.) Applications are invited from registered practitioners for the post of SENIOR HOUSE OFFICER (medical). The appointment, which will be for 1 year in the first instance, is on the terms and conditions of service for hospital medical staff and is at a salary of £745, less a deduction of £145 p.a. in respect of unmarried accommodation provided at the Hospital. The candidate appointed will have general supervision under the Consultant staff of the 70 beds for general medicine and will be attached as a Clinical Assistant for occasional duties which may be required in the Regional Departments of Neurosurgery, Thoracic Surgery, and Plastic Surgery in the Hospital. As the Senior House Officer he will be in charge of the "House" and his duties will include pre-employment medical examinations of staff appointed by the Hospital Management Committee. It is customary for the resident nursing staff to be invited to register on the patients' panel of the Senior House Officer, who is entitled to retain the appropriate fees receivable.

Applications, containing details of qualifications and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, Frenchay Hospital, Bristol, not later than 29th October, 1955.

**BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER required in the Thoracic Surgery Department, which is the Regional Thoracic Surgery Centre (120 Beds) for the South West.

Applications, with full particulars, should be addressed to the Group Secretary, Frenchay Hospital, Bristol, quoting "Thoracic."

**BRISTOL. HAM GREEN HOSPITAL, Pill, near Bristol.** Applications are invited for the post of RESIDENT ASSISTANT PHYSICIAN in the Infectious Diseases Department (350 Beds) of this Hospital. The Hospital contains a major Poliomyelitis Unit, a Tuberculous Meningitis Treatment Centre, and offers wide experience in acute medicine. Salary and conditions on Junior Hospital Medical Officer scale.

Applications, stating age, qualifications, &c., to the Resident Physician.

**BRISTOL (near). HAM GREEN HOSPITAL, Pill, near BRISTOL.** Applications are invited for the post of HOUSE OFFICER in the tuberculosis wards (188 Beds) of the above Hospital. The Hospital is fully equipped for the modern treatment of pulmonary tuberculosis including regular major thoracic surgery.

Apply Secretary, Ham Green Hospital, Pill, near Bristol.

**BRISTOL. THE BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD.** Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in the Department of Neurological Surgery at Frenchay Hospital, Bristol. The appointment will be held for 1 year in the first instance, and be renewable for a further year; it is recognised for the F.R.C.S. The post is open also to those training for a career in medicine.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 29th October, 1955.

**BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL.** (300 Beds.)

CASUALTY HOUSE SURGEON (1 of 3). Duties include work in Orthopædic and Traumatic Unit, vacant 1st November.

HOUSE SURGEON (including gynæcology), 8th November.

HOUSE SURGEON, 18th November.

Above posts recognised for pre-registration and F.R.C.S.

2 HOUSE PHYSICIANS, 16th November and 15th December, recognised for pre-registration.

Applications, stating usual particulars and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

**BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL.** JUNIOR HOSPITAL MEDICAL OFFICER required 1st November as Senior Casualty Officer. Salary £775–£50–£1075.

Applications, stating previous posts held, together with names of 2 referees, to the Administrative Officer.

**BRIGHTON. SUSSEX EYE HOSPITAL, Eastern-road, BRIGHTON, 7.** (56 Beds.) HOUSE SURGEON required by mid-November. Recognised for the F.R.C.S. and D.O., under 23 (*b*).

Applications, stating age, qualifications and experience, naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

**BROMSGROVE, WORCESTERSHIRE. BARNSLEY HALL HOSPITAL FOR MENTAL AND NERVOUS DISEASES.** (750 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER. Accommodation available for single man. Remuneration will be in accordance with the terms and conditions of service issued by the Ministry of Health. Extensive psychiatric outpatient services.

Applications, stating age and experience, together with the names of 3 referees, to the Medical Superintendent.

**BURTON-ON-TRENT GENERAL HOSPITAL.** (251 Beds.) HOUSE SURGEON required immediately. Pre-registration post.

Applications to the Group Secretary at the Hospital.

**BURTON-ON-TRENT GENERAL HOSPITAL.** (251 Beds.) Locum HOUSE SURGEONS required at above Hospital.

Applications to Group Secretary.

**BURTON-ON-TRENT GENERAL HOSPITAL. Resident** ANÆSTHETIST (Junior Hospital Medical Officer) required. (Non-resident considered.)

Applications to Group Secretary.

**BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL.** (285 Beds.) Applications invited for the following posts:—

(*a*) SENIOR HOUSE OFFICER for orthopædic and casualty duties. Recognised for F.R.C.S. Vacant mid-January.
(*b*) HOUSE SURGEON for general and other duties, vacant mid-November.
(*c*) HOUSE SURGEON for general surgical duties. Recognised for F.R.C.S. Vacant mid-January.
(*d*) HOUSE PHYSICIAN for pediatric and general medical duties, vacant early January.
(*e*) HOUSE PHYSICIAN for general medical duties, vacant late November.

All posts except (*a*) recognised for pre-registration.

Inquiries to Hospital Secretary.

**CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN.** (General Children's Hospital of 818 Beds.) Whole-time ANÆSTHETIC REGISTRAR. The surgery practice of the Hospital includes emergency, orthopædic, E.N.T. and general surgery, and there is a Special Surgical Unit in association with the Hospital for Sick Children, Great Ormond-street. The post is recognised by the Faculty of Anæsthetists. Applicants are invited to visit the Hospital by appointment with the Physician-Superintendent.

Applications, on forms obtainable from the Group Secretary, should be submitted by 25th October, 1955.

**CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House** PHYSICIAN for 6 months from 1st December. Recognised Pre-registration Service.

Apply, stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials, to the Secretary by 29th October. Interviews 11th November.

**CAMBRIDGE. FULBOURN HOSPITAL. Senior House** OFFICER (resident or non-resident). Previous psychiatric experience not required. This Hospital of 966 Beds is linked with the Cambridge University Department of Psychology and Addenbrooke's Hospital, and provides a basic psychiatric training leading to the D.P.M.

Applications, stating age, qualifications and experience, with names of 2 referees, should be sent to—

Dr. D. H. CLARK, Medical Superintendent.

Fulbourn Hospital, near Cambridge.

**CARDIFF (near). CAERPHILLY DISTRICT HOSPITAL.** (170 Beds—general surgery and medicine, orthopædic, gynæcology, ophthalmology, obstetrics, E.N.T.) **RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE.** HOUSE SURGEONS (pre-registration candidate if available) required (1 immediately and the other on 24th October) at above Hospital. Salary £425–£525 plus £50 special allowance. Married quarters available 24th October.

Apply, stating age, qualifications, &c., and the names of 2 referees, to the Group Secretary, Rhymney and Sirhowy Valleys Hospital Management Committee Central Offices, Caerphilly-road, Ystrad Mynach.

**CARDIFF (near). CEFN MABLY HOSPITAL, St. Mellons,** near CARDIFF. (158 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required 1st November. Salary £775–£50–£1075. Furnished flat available, rent £63. Pulmonary tuberculosis hospital, 7 miles from Cardiff. Physician-Superintendent also resident.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

**CHELMSFORD AND ESSEX HOSPITAL. (162 Beds.)** Applications are invited for the post of RESIDENT HOUSE SURGEON (pre-registration post). The post will become vacant in the middle of October, and offers good surgical experience and is recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

**CHELMSFORD. ST. JOHN'S HOSPITAL. House** PHYSICIAN (pre-registration, first, second, and third post), Male or Female. Appointment commences 24th October, 1955.

Applications stating age, nationality, qualifications and experience, together with recent testimonials, should be sent immediately to the Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

**CHEPSTOW, MONMOUTHSHIRE. PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE, ST. LAWRENCE HOSPITAL.** (109 plastic surgery, 50 orthopædic beds.) SENIOR HOUSE OFFICER in Plastic Surgery required. Previous experience in specialty not essential. The Hospital intakes from most of Wales and the successful candidate will receive a thorough training. Second Senior House Officer in plastic surgery recently appointed and there is also a Senior House Officer in orthopædics, Senior Registrar non-resident, and 2 Registrars, all in plastic surgery, resident. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

**CHERTSEY, SURREY. ST. PETER'S HOSPITAL** (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON required from 24th October, 1955, Senior House Officer or House Officer (Intern) grade. Post recognised for F.R.C.S. and Pre-registration Service, and preference given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

**CHESTER. BARROWMORE HOSPITAL, Great Barrow, CHESTER.** (173 Beds.) Male SENIOR HOUSE OFFICER (medical). Post vacant immediately. Salary, &c., according to scale. The Hospital is modern in all respects and contains Regional Thoracic Surgical Unit. Applications from ex-patients considered.

Apply, with names of 2 referees, to Physician-Superintendent.

**CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** Applications are invited for the post of MEDICAL REGISTRAR (resident or non-resident) for duty primarily at St. Richard's Hospital, Chichester (400 Beds). Post vacant 1st January, 1956.

Forms of application to be had from the Group Secretary, 174, Broyle-road, Chichester, and to be submitted as soon as possible.

**CHICHESTER. ROYAL WEST SUSSEX HOSPITAL.** (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Post recognised for F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant from 27th November, 1955.

Apply to Senior Administrative Officer.

**COLCHESTER HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for :—

**Essex County Hospital, Colchester** (188 Beds)

SENIOR HOUSE OFFICER (casualty and E.N.T.).

SENIOR HOUSE OFFICER (casualty and radiotherapy).

Posts recognised for F.R.C.S.; tenable for 6 months or 1 year.

Applications, with copies of 3 testimonials, to Group Secretary, 14, Pope's-lane, Colchester, Essex.

**COTTINGHAM, near HULL. CASTLE HILL HOSPITAL.** JUNIOR HOSPITAL MEDICAL OFFICER to work in Major Thoracic Surgery Unit. Residential accommodation available. The Unit has 50 Beds for all types of thoracic surgery, including tuberculous and non-tuberculous, œsophageal, and cardiac.

Applications, with names of referees, to Group Secretary, Hull B Hospital Management Committee, De la Pole Hospital, Willerby, East Yorkshire.

**CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH, SUSSEX.** RESIDENT JUNIOR HOUSE SURGEON appointment now vacant, and RESIDENT JUNIOR HOUSE OFFICER (medical) appointment vacant early November. Pre-registration posts. Health Service terms and conditions.

Applications, stating age, nationality, qualifications and experience, with names of 2 referees, to the Group Secretary, Mid-Sussex Hospital Management Committee, as soon as possible.

**DEWSBURY, YORKSHIRE. STAINCLIFFE GENERAL HOSPITAL.** HOUSE OFFICER (obstetrics and gynæcology), vacant 1st November, 1955, and tenable for 6 months. Recognised pre-registration post. The Hospital has 37 obstetric and 24 gynæcological beds.

Applications, with full details, and quoting this Journal, to to the Administrative Officer at the Hospital.

**DONCASTER ROYAL INFIRMARY. (330 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD.** Whole-time REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th October, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

**DONCASTER. HAMILTON ANNEXE, WESTERN HOSPITAL.** (Recognised under the Regulations for the D.Obst.R.C.O.G. and M.R.C.O.G. (obstetrical experience) and approved for Pre-registration Service under the Medical Act, 1950.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of OBSTETRICAL HOUSE OFFICER (Senior House Officer or pre-registration post), vacant early November.

Applications should be forwarded to the Secretary to the Committee at Doncaster Royal Infirmary by 20th October.

**DOUGLAS, I.O.M. NOBLE'S ISLE OF MAN HOSPITAL.** (160 Beds.) Applications are invited from registered medical practitioners with previous hospital experience, preferably at a teaching hospital, for the post of SENIOR HOUSE SURGEON at this busy General Hospital. The senior of 4 House Officer posts. The post becomes vacant at 31st October, and is suitable for candidate seeking further clinical experience and opportunity for reading for higher qualification. Salary £745 p.a., with a deduction of £125 p.a. for board, lodging, &c., if resident.

Applications, giving relevant particulars, and copies of 2 recent testimonials, or names and addresses of 2 referees, should be forwarded to the Secretary, Noble's Isle of Man Hospital, Douglas.

**DOUGLAS, I.O.M. NOBLE'S ISLE OF MAN HOSPITAL.** (160 Beds.) Applications are invited for the post of HOUSE SURGEON. The post is recognised for pre-registration purposes, and is now vacant. 4 residents on the staff. Salary £425–£475–£525 according to experience. A deduction of £125 a year for residential emoluments. Appointment for 6 months.

Apply immediately, giving full particulars and copies of 2 recent testimonials or names and addresses of 2 referees, to the Secretary, Noble's Isle of Man Hospital, Douglas.

**DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL.** (247 Beds.) HOUSE PHYSICIAN (first, second, or third post), vacant 4th November. Approved pre-registration post. Fully qualified practitioners may apply. Duties to include acute and chronic sick and casualties. Good general experience for first house appointment.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

**EDGWARE GENERAL HOSPITAL. (715 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** REGISTRAR (whole-time), resident, required in Department of Anæsthesia at above Hospital. Vacant 15th November, 1955. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from, and returnable to, Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 25th October, 1955.

**EDGWARE GENERAL HOSPITAL, Edgware, Middlesex.** (715 Beds.) 2 RESIDENT HOUSE SURGEONS. Posts vacant 14th and 17th November, 1955. 6 months appointments. Posts recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 29th October, 1955.

**EAST ANGLIAN REGIONAL HOSPITAL BOARD.**

(1) SENIOR ANÆSTHETIC REGISTRAR, Peterborough Memorial Hospital and Annexes. Recognised for D.A. and F.F.A.R.C.S. and provides experience in all departments including a Thoracic Unit. Candidates are invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Memorial Hospital, Peterborough.

(2) (*a*) SENIOR REGISTRAR; and

(*b*) REGISTRAR in Mental Deficiency and Child Psychiatry, Little Plumstead (near Norwich) Mental Deficiency Group of Hospitals and Child Psychiatry Service. The group (900 Beds) which is progressive and the centre for much outpatient work including child guidance clinics, is recognised as a training centre for the D.P.M. by the Conjoint Board for 1 year. Accommodation available. Candidates invited to visit Hospital by direct arrangement with Medical Superintendent.

Applications, stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 24th October, 1955.

**EAST ANGLIAN REGIONAL HOSPITAL BOARD.**

(1) REGISTRAR in E.N.T. Surgery, Norfolk and Norwich Hospital and Jenny Lind Children's Hospital, Norwich. Post recognised for D.L.O. and F.R.C.S. Appointment for 1 year, renewable for second year. Candidates are invited to visit Hospital by direct arrangement with the Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

(2) RADIOLOGICAL REGISTRAR, Ipswich and East Suffolk Hospital (Anglesea Road Wing). The department is the centre for consultant radiological services for the Ipswich Hospital Group. Post recognised for D.M.R.D. Part II examination. Appointment for 1 year, renewable for second year.

(3) SURGICAL REGISTRAR, North Cambridgeshire Hospital, Wisbech. Post provides good training and experience in both general and orthopædic surgery. Appointment for 1 year, renewable for second year.

(4) ORTHOPÆDIC REGISTRAR, Norfolk and Norwich Hospital (441 Beds). Post provides excellent training. Appointment for 1 year, renewable for second year.

Candidates invited to visit hospitals (2, 3, and 4), by direct arrangement with Hospital Management Committee Secretaries at the hospitals.

Applications, stating age, experience and the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 31st October, 1955.

**ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL.** Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer grade) for duties in the area Laboratory and at other hospitals in the Group. The area Laboratory is recognised for the Diploma of Pathology of the Royal Colleges of Physicians and Surgeons. Further information can be obtained from the Senior Pathologist. Appointment tenable for 1 year.

Applications, with the names of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, immediately.

**ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL.** SENIOR HOUSE OFFICER for casualty duties required 27th December, 1955. Non-resident post. Recognised by Royal College of Surgeons for the Final Fellowship examination. 12 months appointment. Hours: 9 A.M.–5.30 P.M. Monday–Friday; 9 A.M.–1 P.M. Saturday.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee.

**ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL.** Appointment of RESIDENT HOUSE SURGEON (third post), vacant 16th December, 1955. Duties with General Surgical Unit which includes some orthopædics. 6 months appointment. Post recognised by the Royal College of Surgeons.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee.

**ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL.** ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. Appointment of RESIDENT HOUSE SURGEON (approved pre-registration post), vacant 25th October, 1955. General surgical duties. 6-month appointment.

Applications to the Secretary of the Management Committee as soon as possible.

**EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.)** RESIDENT SENIOR HOUSE OFFICER (surgery) as Casualty Officer and Orthopædic House Surgeon. Post vacant 2nd November, 1955. Recognised training post for F.R.C.S. Busy general hospital with easy access to London. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 recent testimonials, to the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 26th October, 1955.

**EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY.** SENIOR HOUSE OFFICER (casualty) required immediately. Post non-resident, recognised for F.R.C.S. 12-month appointment. Busy Casualty and Outpatient Department with excellent experience in minor and traumatic surgery. Candidates should have held previous House Officer posts.

Applications, stating age, qualifications, experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

**GUILDFORD. ROYAL SURREY COUNTY HOSPITAL.** (232 Beds.) RESIDENT HOUSE SURGEON required for general surgery. Post is vacant on 21st November and tenable for 6 months. It is approved for pre-registration practitioners and recognised for the F.R.C.S. examination.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

**GUILDFORD. ROYAL SURREY COUNTY HOSPITAL.** (232 Beds.) SENIOR HOUSE OFFICER for Anæsthetics required. The holder can be resident or non-resident. Post is vacant on 2nd January, 1956, and is recognised for F.F.A.R.C.S. Operations in main theatres totalled 4536 in 1954 and there is a large Casualty Department.

Apply, with full details of experience and copies of 3 testimonials, to the Hospital Secretary.

**GLASGOW, S.W.1. SOUTHERN GENERAL HOSPITAL.** SENIOR HOUSE OFFICER in the Department of Anæsthesia. Applicants must be qualified at least 2 years.

Apply within 10 days to Secretary, Board of Management for Glasgow South-Western Hospitals, 1301, Govan-road, Glasgow, S.W.1, naming 2 referees.

**HASTINGS. ROYAL EAST SUSSEX HOSPITAL.** (150 Beds.) HOUSE PHYSICIAN required. Resident—Male or Female. Pre-registration post, vacant 18th November. National scale of salary.

Apply to Hospital Administrator.

**GLASGOW. HAWKHEAD (MENTAL) HOSPITAL,** 510, Crookston-road, GLASGOW, S.W.3. Applications are invited for post of SENIOR HOUSE OFFICER in Psychiatry (Male or Female), resident or non-resident. The post offers wide experience in all aspects of psychiatry (inpatient and outpatient). All modern methods of treatment carried out. Recognised for D.P.M. Previous psychiatric experience not required.

Applications, with names of 2 referees, should be forwarded to Physician-Superintendent at above address.

**HITCHIN. LISTER HOSPITAL. (330 Beds.)** North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time MEDICAL REGISTRAR (resident) required at above Hospital. Post gives good all-round experience, valuable for the M.R.C.P. Vacant 1st January, 1956. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Luton and Hitchin Hospital Management Committee, St. Mary's Hospital, Luton, Beds, 31st October, 1955.

**HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE SURGEON to the Princess Royal Maternity Home (57 Beds), to commence duty on 21st November, 1955. The holder of the post, which is recognised for the D.Obst.R.C.O.G., will have access to the abnormal maternity and gynæcological beds at The Royal Infirmary. The Department is under the control of 2 Consultant Obstetricians and Gynæcologists. Salary in accordance with national scale.

Applications to be addressed to—

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

**HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.)** HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN to commence duties immediately. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

**HUNTINGDON COUNTY HOSPITAL. Applications** are invited for the post of HOUSE OFFICER (surgical) becoming vacant beginning November. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket.

**HUNTINGDON COUNTY HOSPITAL. Applications are** invited for the post of HOUSE OFFICER (medical). Post recognised for pre-registration purposes. The selected candidate will be required to look after medical and pædiatric cases and may be called upon to give emergency anæsthetics. Post vacant early October.

Apply, with full particulars and names of 2 referees, to Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket.

**IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea** ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consulting Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

**ISLEWORTH. WEST MIDDLESEX HOSPITAL. Senior** HOUSE OFFICER required for Psychiatric Unit. Duties mainly in observation wards. Post recognised by Conjoint and R.M.P.A. as D.P.M. training post.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 25th October, 1955.

**ISLEWORTH. WEST MIDDLESEX HOSPITAL. (1142** Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Pathology, whole-time, resident or non-resident. If non-resident, must sleep in on nights on duty. General laboratory and emergency duties with training in all branches. Previous laboratory experience desirable. Candidates may visit Hospital by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 25th October, 1955.

**LUTON AND DUNSTABLE HOSPITAL. (250 Beds.)** NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) required at above Hospital and associated units (134 Beds). Post vacant now, and recognised for D.A. The Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, by 20th October, 1955.

**LANCASTER MOOR HOSPITAL, Lancaster. (Regional** MENTAL HOSPITAL.) MANCHESTER REGIONAL HOSPITAL BOARD. Applications invited for the post of RESIDENT REGISTRAR (1 vacancy), Male or Female. Unfurnished flat in Hospital grounds available for married applicants if required; furnished quarters for single persons. Hospital recognised for D.P.M. and facilities provided for attending courses of instruction at neighbouring universities. All modern methods of investigation and treatment carried out; successful candidate required to work under supervision of Consultant Psychiatrists by rotation, both for inpatient and outpatient work.

Apply Medical Superintendent.

**LEICESTER ROYAL INFIRMARY. Applications are** invited for the pre-registration post of HOUSE SURGEON vacant immediately. Recognised for F.R.C.S.

Applications, stating age and qualifications, with copies of recent testimonials, to the Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, forthwith.

**LLANELLY HOSPITAL, Llanelly, Carmarthenshire.** GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Surgical Unit of 75 Beds. The post offers excellent experience in general surgery and the Hospital is recognised under the F.R.C.S. regulations. The successful candidate will also be expected to participate in the general work of the Hospital.

Full particulars, stating age, experience, and qualifications, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary.

**LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS.** Applications are invited for a resident post of SENIOR HOUSE OFFICER (E.N.T.) at the Liverpool Ear, Nose and Throat Infirmary for the period to 30th September, 1956.

Apply by 29th October, 1955, on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

**LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS.** Applications are invited for posts as REGISTRAR in Radiology for the period to 30th September, 1956. Annual reappointment thereafter until completion of the normal period of training will be considered without need for further application.

Apply, by 26th October, on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

**LOUTH, LINCOLNSHIRE. COUNTY INFIRMARY.** (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædic and casualty), now vacant at this General Hospital.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

**LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (anæsthetics) for duties mainly at St. James's Hospital. The appointment which is recognised for the D.A. and the F.F.A.R.C.S. will be for a period of 1 year, and the salary will be in accordance with the agreed terms and conditions of service of hospital medical staff, namely £745 p.a., with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

**LEEDS REGIONAL HOSPITAL BOARD. Registrar** vacancies.

*Anæsthetics*

Huddersfield Group (approximately 225 Beds in the surgical specialties). Resident or non-resident.

*General Surgery*

Duties at the Victoria Hospital, Keighley (55 surgical beds). Recognised for F.R.C.S.

*Psychiatry*

Meanwood Park (Mental Deficiency) Hospital, Leeds (700 Beds). Accommodation available for single person. Facilities for attendance at the Leeds University will be provided if the successful candidate is studying for the D.P.M.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 20th October, 1955.

**LEEDS REGIONAL HOSPITAL BOARD. Registrar in** Chest Diseases for duties at Leeds Chest Clinic and at Killingbeck and St. George's Hospitals. Previous experience in diseases of the chest and higher qualification desirable. Resident at Killingbeck Hospital.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 20th October, 1955.

**LEEDS. THE UNITED LEEDS HOSPITALS. The** GENERAL INFIRMARY AT LEEDS. SENIOR HOUSE OFFICER in Neurosurgery required for a period of 6 months from 1st November, 1955. The appointment will be renewable for a further period of 6 months. Terms and conditions of service for hospital medical staff apply.

Applications giving details of age, qualifications, posts held with dates, and with 3 names for reference, should be sent to the Secretary to the Board as soon as possible.

**LEEDS. THE UNITED LEEDS HOSPITALS. The** GENERAL INFIRMARY AT LEEDS. RESIDENT ORTHOPÆDIC OFFICER (Senior House Officer status) required, as from 1st November, 1955. The post will be for an initial period of 6 months, renewable for a further 6 months thereafter.

Applications, stating age, qualifications and previous posts with dates, with the names of 3 referees, should reach the Secretary to the Board as soon as possible.

**LEEDS. THE UNITED LEEDS HOSPITALS. Senior** HOUSE OFFICER in General Medicine required for duties as Resident Medical Officer at the annexe (117 Beds) of the General Infirmary at Leeds. The post may entail some duties at the Infirmary. Terms and conditions of service for hospital medical and dental staffs apply.

Applications, giving age, qualifications, previous posts, with dates, and 3 names for reference, should be sent to the Secretary to the Board.

**LEEDS. THE UNITED LEEDS HOSPITALS.** The GENERAL INFIRMARY AT LEEDS. HOUSE SURGEON required for Neurosurgical Department for 6 months from 1st November (pre-registration post). Terms and conditions of service for hospital medical and dental staffs apply.

Applications, giving details of age, education, experience, if any, with the names of 3 referees, to be sent to the Secretary to the Board as soon as possible.

**MAIDSTONE. WEST KENT GENERAL HOSPITAL.** (141 Beds.) MID KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING ROOM OFFICER. Salary £745 a year, with a deduction of £150 a year for residential emoluments.

Applications to the Administrative Officer at the Hospital as soon as possible.

**MANCHESTER REGIONAL HOSPITAL BOARD.** Applications are invited for a post of REGISTRAR in General Medicine to the Barrow and Furness Group of hospitals, with main duties at North Lonsdale Hospital and Devonshire Road Infectious Diseases Hospital. Available 1st January.

Applications to Group Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness, not later than 20th October, 1955.

**MANCHESTER REGIONAL HOSPITAL BOARD.** Applications are invited for a post of REGISTRAR in the Obstetric and Gynæcology Department in the Barrow and Furness Group of hospitals, available about 1st February, 1956. 72 obstetric/gynæcological beds in main unit; outpatient departments and extensive surgical experience. Recognised for D.Obst.R.C.O.G.

Applications to Group Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness, not later than 27th October, 1955.

**MANCHESTER REGIONAL HOSPITAL BOARD.** Senior REGISTRAR in General Medicine in the South Manchester Group of hospitals, mainly at Withington Hospital, Manchester. M.R.C.P. desirable. Arrangements may later be made for the person appointed to transfer to the United Manchester Hospitals (Manchester Royal Infirmary) for further experience and training.

Application forms, obtainable from the Senior Administrative Medical Officer, Cheetwood-road, Manchester, 8, should be returned by 31st October, 1955.

**MANCHESTER. UNITED MANCHESTER HOSPITALS.** MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for SENIOR HOUSE OFFICER post. Salary £745 p.a., less £155 p.a. for residential emoluments.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

**MANCHESTER. CRUMPSALL HOSPITAL.** (Acute—1225 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of REGISTRAR in the Department of Neurosurgery at the above Hospital. The holder of the post will be allowed more scope than is usual in larger departments.

Applications, with full details and names of 2 referees, to Group Secretary, Crumpsall Hospital, Manchester, 8.

**MANCHESTER. WEST MANCHESTER HOSPITAL** MANAGEMENT COMMITTEE.

**Park Hospital, Davyhulme** (General Hospital—433 Beds)

1 HOUSE OFFICER (general surgery) required. Pre-registration. Post recognised for F.R.C.S. examination. Vacant November.

1 SENIOR HOUSE OFFICER (general surgery) required. Vacant mid-November.

**Eccles and Patricroft Hospital** (General Hospital—48 Beds)

1 SENIOR HOUSE OFFICER required. The work of the Hospital is mainly surgical and there is a busy Outpatient Department. Post now vacant.

Forms from Secretary, Park Hospital, Davyhulme.

**MANCHESTER AND SALFORD HOSPITAL FOR** SKIN DISEASES, Quay-street, MANCHESTER, 3. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (resident). The appointment is for a period of 12 months.

Applications, stating age, qualifications with dates, nationality, and accompanied by copies of 2 recent testimonials, to be sent immediately to the Hospital Secretary.

**MANCHESTER. SPRINGFIELD HOSPITAL, Crumpsall,** MANCHESTER, 8. SPRINGFIELD AND SWINTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at this Mental Hospital of over 750 Beds. Modern methods of investigation and treatment are carried out. Facilities will be granted for attendance at the Course of D.P.M. of the University of Manchester (with the Department of Psychiatry, of which this Hospital is associated). Preference given to candidates who have previous general hospital and/or psychiatric experience. Accommodation is available for a single person. Terms and conditions of the National Health Service apply. Further particulars can be obtained from, and the Hospital may be visited by arrangement with, the Medical Superintendent.

Applications, giving details of age, experience, &c., and the names of 3 referees, to the Medical Superintendent as soon as possible.

**NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** Whole-time REGISTRAR in Dermatology, based on West Middlesex Hospital, Isleworth (1142 Beds). Duties will include also clinics at hospitals in the Uxbridge, Staines, and Windsor Groups. Appointment for 1 year in first instance. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Group Hospital Management Committee, West Middlesex Hospital, Isleworth, by 1st November, 1955.

**NEWCASTLE REGIONAL HOSPITAL BOARD.** SUNDERLAND AREA HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR PHYSICIAN (whole-time), Royal Infirmary, Sunderland (300 Beds). Accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate, Hospital, Benfield-road, Newcastle upon Tyne, 6, within 7 days.

**NEWCASTLE REGIONAL HOSPITAL BOARD.** East CUMBERLAND HOSPITALS. Whole-time REGISTRAR ANÆSTHETIST for 1 year with probable extension for further period. Accommodation (single) at the Cumberland Infirmary, Carlisle. Post recognised for D.A. and F.F.A.R.C.S.

Applications, with names of 1–3 referees, to the Senior Administrative Medical Officer, 72, Warwick-road, Carlisle, within 14 days.

**NEWCASTLE. THE UNITED NEWCASTLE UPON** TYNE HOSPITALS. Applications are invited for the non-resident appointment of REGISTRAR to the Throat, Nose and Ear Department at the Royal Victoria Infirmary. The successful candidate will have opportunity for clinical experience in inpatient and outpatient work under the direction of the Head of the department and will be responsible for clinical emergency duty as required. The appointment is for 1 year in the first instance and is subject to the terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full particulars and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

**NEWPORT, MONMOUTHSHIRE. ROYAL GWENT** HOSPITAL. (260 Beds. Recognised F.R.C.S.) 2 SENIOR HOUSE OFFICERS required for Casualty Department, 1 early in October and the other about 1st November. Resident or non-resident. This is the base Hospital in the Group and all medical and surgical emergencies are admitted through casualty, which is under the full-time charge of a Senior Hospital Medical Officer. A new department with excellent facilities has recently been opened. Post recognised F.R.C.S. for 6 months, and tenable 6 or 12 months as desired. Salary £745, less £125 for board if resident.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

**NEWTON ABBOT HOSPITAL.** (General Section—65 Beds.) RESIDENT SENIOR HOUSE SURGEON (Male or Female) required approximately 23rd October, 1955. Married quarters available.

Applications (quoting Ref. F.364/31), stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

**NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL AND RADIUM INSTITUTE.** NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (resident) required at above Hospital which may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 1st November, 1955.

**NORWICH. NORFOLK AND NORWICH HOSPITAL.** Locum ORTHOPÆDIC REGISTRAR required immediately. Salary £17 10s. per week in accordance with Ministry of Health terms and conditions of service. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Secretary, Hospital Management Committee, St. Stephen's-road, Norwich.

**NOTTINGHAM CITY HOSPITAL.** (804 Beds.) Applications are invited for the post of HOUSE SURGEON, vacant 15th November, 1955. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

**NOTTINGHAM. CITY HOSPITAL.** (804 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Thoracic Surgery. Post vacant 1st December, 1955. Salary £745 p.a., less £150 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

**NOTTINGHAM GENERAL HOSPITAL.** Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (casualty). Duties to commence 1st November. Establishment 3. Recognised for the F.R.C.S. Post offers wide experience of casualty work.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

**OXFORD. UNITED OXFORD HOSPITALS.** Applications invited for the post of NON-RESIDENT REGISTRAR in Anæsthetics to the United Oxford Hospitals with immediate effect.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 24th October, 1955.

**OXFORD. WINGFIELD-MORRIS ORTHOPÆDIC HOSPITAL.** Applications are invited from suitably qualified persons for a SENIOR HOUSE OFFICER grade appointment from 1st January, 1956.

Applications, with names of referees, to be submitted to the Secretary within 14 days of this advertisement.

**OXFORD REGIONAL HOSPITAL BOARD.** Whole-time REGISTRAR in Psychiatry, St. John's Hospital, Stone, near Aylesbury (805 Beds). Married or single accommodation available. Appointment for 1 year, eligible for extension to a second year.

Applications obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should be returned by 24th October.

**ORPINGTON HOSPITAL, Orpington, Kent.** Resident SENIOR HOUSE PHYSICIAN required early December for 60-Bedded Tuberculosis Unit (30 male and 30 female). Affords good clinical experience in diagnosis and treatment of acute and chronic pulmonary tuberculosis. Offers excellent opportunity for higher qualification study, with access to clinical material in Hospital's general medical and surgical wards. Ex-patient medical officer favourably considered.

Apply Physician-Superintendent.

**PERTH ROYAL INFIRMARY.** Applications are invited for the post of SENIOR HOUSE OFFICER (Anæsthetic Department). The post is recognised under regulations for the D.A. and F.F.A.R.C.S.

Applications, giving details of age, qualifications, experience, and names of 2 referees, should be sent to the Group Medical Superintendent, Perth Royal Infirmary, Perth.

**PLYMOUTH. SOUTH DEVON AND EAST CORNWALL** HOSPITAL.

HOUSE SURGEON (pre-registration post), vacant 1st December, 1955. Devonport Section.

HOUSE PHYSICIANS (pre-registration posts), 2 vacancies 1st January, 1956. Freedom Fields Section.

HOUSE SURGEONS (pre-registration posts), 2 vacancies 1st January, 1956. Recognised for the F.R.C.S. Freedom Fields Section.

PÆDIATRIC HOUSE PHYSICIAN, vacant 1st January, 1956. Recognised for the D.C.H. Freedom Fields Section.

HOUSE SURGEONS (pre-registration posts), vacancies 12th December, 1955. 1st and 11th January, 1956. Recognised for the F.R.C.S. Greenbank Road Section.

HOUSE PHYSICIANS (pre-registration posts), 2 vacancies 1st January, 1956. Greenbank Road Section.

Applications, stating age, nationality, qualifications, and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth.
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

**PONTEFRACT AND CASTLEFORD HOSPITAL MANAGEMENT** COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER to assist Geriatric Physician in the staffing of an active Geriatric Unit at hospitals in this and Wakefield A Hospital Management Committee area. Accommodation available.

Applications immediately to Secretary, Gt. Northern House, Salter-row, Pontefract, Yorks.

**PORTSMOUTH. SAINT MARY'S HOSPITAL.** (130 acute surgical beds.) PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SURGICAL REGISTRAR at above Hospital, vacant 26th December, 1955. The post will include duties in the Department of Thoracic Surgery (15 Beds). The successful candidate must hold the F.R.C.S. degree.

Forms of application may be obtained from the Acting Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 24th October, 1955. Canvassing will disqualify. Candidates may visit the above Hospital by arrangement with the Acting Group Secretary.

**PORTSMOUTH GROUP HOSPITAL MANAGEMENT** COMMITTEE.

**Royal Portsmouth Hospital** (104 orthopædic and 70 surgical beds)

SENIOR HOUSE OFFICER (Orthopædic Department), vacant now.

HOUSE OFFICER (orthopædic), vacant now.

**St. Mary's Hospital** (130 surgical beds)

HOUSE SURGEON (pre-registration), vacant 1st November, 1955.

Applications, stating age, experience and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.
35, Grove-road South, Southsea.

**RAMSGATE. GENERAL HOSPITAL. (101 Beds.)** HOUSE SURGEON. Approved pre-registration post. Salary at the rate of £425–£525 p.a., according to experience, less £125 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

**REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road,** REDHILL, SURREY. (139 Beds.) SENIOR HOUSE OFFICER (surgical), Male, required immediately.

Apply to the Hospital Secretary.

**ROMFORD, ESSEX. RUSH GREEN HOSPITAL.** REGISTRAR required for the Regional Poliomyelitis Unit (30 Beds), the vacancy being for a minimum period of 3 months commencing mid-November. The post affords excellent opportunity for the study and care of respiratory and bulbo spinal poliomyelitis with different types of modern apparatus.

Applications as soon as possible to the Medical Superintendent.

**ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301** Beds.) SENIOR HOUSE OFFICER (Male or Female) required from 9th November, 1955, to work for the time being in the Regional Poliomyelitis Unit (30 Beds) and subsequently in general medical duties. Resident post.

Applications to Medical Superintendent.

**SCOTLAND. NORTHERN REGIONAL HOSPITAL** BOARD. Applications are invited for the whole-time post of REGISTRAR at the County Hospital, Stornoway (tuberculosis and infectious diseases). A house is available for a married officer.

Further particulars and forms of application are available from the undersigned, with whom applications should be lodged by 29th October, 1955. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

**SCOTLAND. NORTHERN REGIONAL HOSPITAL** BOARD. Applications are invited for the whole-time post of SENIOR REGISTRAR in Orthopædic Surgery. The main duties are at Raigmore Hospital, Inverness. Previous experience in orthopædic surgery and a higher surgical qualification are desirable.

Schedules of application and further particulars are obtainable from the undersigned, with whom applications should be lodged by 29th October, 1955. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

**SCOTLAND. NORTHERN REGIONAL HOSPITAL** BOARD invite applications for the post of SENIOR REGISTRAR in Obstetrics and Gynæcology. The main duties are at Raigmore Hospital and the Royal Northern Infirmary, Inverness.

Schedules of application and further particulars are obtainable from the undersigned, with whom applications should be lodged by 29th October, 1955. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

**SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD.** Applications are invited for a whole-time appointment of Transitional SENIOR REGISTRAR in Medical Pædiatrics at the Edinburgh Northern Group of hospitals, from 1st October, 1955, to 31st December, 1956. The salary will be at the rate of £1400 p.a. and the person appointed should have already completed the greater part of his training in medical pædiatrics. The person appointed will be expected to undertake teaching duties.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 3 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 5th November, 1955.

**SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD.** Applications are invited for 2 appointments of REGISTRAR in Diseases of the Chest for duties in the first place with the Edinburgh Royal Victoria and Associated Hospitals. The posts will be associated with the Department of Tuberculosis and Diseases of the Chest, Edinburgh University, and the holder will be expected to undertake teaching duties and assist in research.

Applications, giving particulars of age, previous experience and qualifications, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 5th November, 1955.

**SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the whole-time appointment of Transitional SENIOR REGISTRAR in Medicine at the Northern Hospital, Dunfermline, from 1st November, 1955, to 31st December, 1956. The salary will be at the rate of £1400 p.a., and the person appointed should have already completed the greater part of his Senior Registrar training in medicine.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 5th November.

**SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the post of SENIOR REGISTRAR in Medicine, with experience in cardiology, at the Western General Hospital, Edinburgh, from 6th March, 1956. Duties will include teaching, and there are full opportunities for research.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

**SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD.** Applications are invited for an appointment as REGISTRAR in Surgery to the Edinburgh Northern Group of hospitals from 1st March, 1956.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 12th November, 1955.

**SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL.** WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (casualty) required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications together with copies of 2 testimonials, to Hospital Secretary.

**SOUTHAMPTON GENERAL HOSPITAL. (471 Beds—** 87 surgical.) 2 HOUSE SURGEONS required end of November and mid-December, 1955. Posts tenable for 6 months. Both recognised for F.R.C.S. and Pre-registration Service.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

**SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL.** (278 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required mid-October. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

**SALISBURY GROUP HOSPITAL MANAGEMENT COMMITTEE.** SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of DENTAL REGISTRAR to the Plastic and Oral Surgery Centre at Odstock Hospital. Post vacant 1st January, 1956, and is approved for the Dental Fellowship. Candidates may visit the Unit by appointment.

Application forms obtainable from the Group Secretary, Odstock Hospital, Salisbury, should be returned by 29th October, 1955.

**SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised** for M.R.C.O.G.) Applications are invited for the resident post of SENIOR HOUSE OFFICER (gynæcology), vacant 1st January, 1956. Duties divided between units in charge of Professor of Obstetrics and Gynæcology, University of Sheffield, and full-time Consultant respectively.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and names of 2 persons to whom reference may be made, should be forwarded to the undersigned at Nether Edge Hospital, Sheffield, 11. W. STANSFIELD, Secretary.

**SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS.** ROYAL INFIRMARY UNIT. Applications are invited for the resident post of SENIOR HOUSE OFFICER in Anæsthetics at the above Hospital. Post vacant 15th January, 1956.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent immediately to the Superintendent, Royal Infirmary, Sheffield, 6.

**SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL.** (500 Beds.) HOUSE PHYSICIAN, for Pre-registration Service, vacant 1st November, 1955.

Applications, with copy testimonials, to Group Secretary, Royal Salop Infirmary, Shrewsbury.

**SHREWSBURY. ROYAL SALOP INFIRMARY.** ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). Successful applicant will be allowed to attend for 2 days a month at the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study, with the Consultant. Post recognised under revised Fellowship regulations in respect of 6 months training required for the Final Fellowship examination.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

**SHREWSBURY. EYE, EAR AND THROAT HOSPITAL.** SENIOR HOUSE OFFICER (E.N.T.). Duties at E.N.T. Hospital (68 Beds) and Copthorne Hospital (168 Beds). Post recognised for the D.L.O.R.C.S.

Applications, with copy testimonials, to the Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

**SIDCUP AND SWANLEY HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER (casualty and orthopædic) required immediately. The first 3 months will be as Casualty Officer and the second 3 months in Orthopædic Department. The post is recognised under the Fellowship regulations as a period of 6 months casualty training. Salary £745 p.a., less £150 p.a. residential emoluments.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Queen Mary's Hospital, Sidcup, Kent.

**SOUTHEND-ON-SEA, ESSEX. GENERAL HOSPITAL.** Applications are invited for the post of SECOND CASUALTY OFFICER (Senior House Officer grade) recognised for F.R.C.S., for duties in Fracture and Orthopædic Department. Resident. Post vacant 1st November, 1955.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to reach undersigned as soon as possible. J. C. FIELD, Secretary.

**SWANSEA. MORRISTON HOSPITAL, Morriston,** SWANSEA. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Neurosurgical Department of the above Hospital. The department is the centre for neurosurgery for South West Wales and the post affords excellent opportunities for the study for higher degrees.

Applications, together with copies of 2 recent testimonials, should be forwarded to the Medical Superintendent at the Hospital.

**SWANSEA. MOUNT PLEASANT HOSPITAL. (238** Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Female) for work in the Medical and Surgical Departments, and in the Chronic Sick Wards of the above Hospital.

Applications, stating age, experience, and qualifications, with copies of 2 recent testimonials, should be addressed to the Hospital Secretary.

**SWANSEA HOSPITAL, Swansea. (407 Beds.) Glantawe** HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Traumatic and Orthopædic Department of the above Hospital. The post is recognised under the F.R.C.S. regulations for 6 months casualty training. It offers exceptional experience in all aspects of traumatic surgery as occurring in a large industrial centre and port.

Applications, stating age and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary.

**STOKE-ON-TRENT. CITY GENERAL HOSPITAL.** HOUSE OFFICER (general surgery) required. Recognised F.R.C.S. and pre-registration.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

**STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY.** (455 Beds.) SENIOR HOUSE OFFICER (E.N.T.) required. Recognised F.R.C.S.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

**STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY.** HOUSE OFFICER (general surgery), vacant shortly. Recognised F.R.C.S. and pre-registration.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

**STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY.** SENIOR HOUSE OFFICER (anæsthetics) required. Recognised D.A. Recognition F.F.A.R.C.S. applied for. Previous anæsthetic experience desirable but not essential.

Detailed applications to Hospital Management Committee Secretary, Princes-road, Stoke-on-Trent.

**TAUNTON AND SOMERSET HOSPITAL.** Applications are invited for the post of HOUSE OFFICER (E.N.T.), vacant now. Pre-registration appointment.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees, should be forwarded immediately to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch.

**WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL.** Applications invited for position of SENIOR HOUSE OFFICER in the following Regional Units, (i) Thoracic Surgery Department, (ii) Neurological Department. Salary £745 p.a. A charge of £155 p.a. is made for accommodation.

Address written applications, giving full personal particulars and details of experience, &c., together with 2 names and addresses for reference, to—

W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

**WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL.** Applications invited for appointment of JUNIOR HOSPITAL MEDICAL OFFICER for the Leeds Regional Thoracic Centre (59 Beds) at Pinderfields General Hospital. The Centre deals with thoracic and upper abdominal surgery in association with the Thoracic Consultants of the General Infirmary at Leeds. Salary scale £775–£50–£1075 p.a., less a charge of £155 for board, lodging, &c.

Address written applications with full particulars and 2 names and addresses for reference to—

W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

**WARLINGHAM PARK HOSPITAL MANAGEMENT COMMITTEE.** Registered medical practitioners are invited to apply for the appointment of REGISTRAR. Opportunity will be given for experience in all branches of psychiatry, psychoneurosis, industrial psychiatry, delinquency, and child guidance. Candidates may visit the Hospital (by arrangement with the Medical Superintendent) but canvassing in any way will disqualify.

Application forms (5 to be completed) may be obtained from the Group Secretary, Warlingham Park Hospital, Warlingham, Surrey, on receipt of a stamped addressed envelope, and must be returned within 14 days of the appearance of this advertisement.

**WARRINGTON INFIRMARY. (172 Beds.) Applications** are invited from persons experienced in anæsthetics for the post of RESIDENT ANÆSTHETIST (Male or Female), graded as Senior House Officer. The Hospital is recognised for the D.A. examination. Salary £745 p.a., less a deduction of £195 p.a. for residential emoluments.

Applications, stating qualifications and experience, should be sent to— H. L. BOOT, Group Secretary,

Warrington and District Hospital Management Committee.

c/o General Hospital, Warrington, Lancs.

**WARRINGTON INFIRMARY. (172 Beds.) Applications** are invited for a vacancy at the above Hospital for a RESIDENT HOUSE SURGEON (Male or Female). Recognised for pre-registration. Salary will be £425–£525 p.a., less a deduction of £125 for full residential emoluments.

Applications should be sent to—

H. L. BOOT, Group Secretary,

Warrington and District Hospital Management Committee.

c/o General Hospital, Warrington, Lancashire.

**WATFORD MATERNITY HOSPITAL, King-street,** WATFORD. (58 Beds.) Applications are invited for the residential post of SENIOR OBSTETRICS OFFICER for duties commencing 23rd November, 1955. Salary £745 p.a., less £155 p.a. for residential emoluments. Hospital recognised for M.R.C.O.G. examination.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible after the appearance of this advertisement.

**WEST DORSET GROUP HOSPITAL MANAGEMENT COMMITTEE.** SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PATHOLOGICAL REGISTRAR (preferably resident) required. General laboratory and emergency duties, with training in all branches. Some laboratory experience essential. Salary on Registrar grade, less £160 p.a. if resident. The Laboratory is modern and well equipped and a P.H.L.S. Unit is housed in the same building, so that a wide experience is available. Candidates may visit by appointment.

Application form, returnable by 22nd October, 1955, from Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

**WEST CORNWALL CLINICAL AREA. The Board of** GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Obstetrics and Gynæcology. The appointment will be held for 1 year in the first instance and be renewable for a further year. The successful candidate will be appointed to work for the first year mainly at the Camborne-Redruth Miners' and General Hospital, Redruth, but may be required to undertake duties in other hospitals in the area. The post, which is resident, is recognised for the M.R.C.O.G. and becomes vacant on 11th January, 1956.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 29th October, 1955.

**WIGAN AND LEIGH HOSPITAL MANAGEMENT** COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), resident, for duties at Wigan Infirmary, Billinge Hospital, and other hospitals in the Group. Post recognised for F.F.A.R.C.S. examinations. Facilities for experience in major thoracic and orthopædic work.

Applications to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

**WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-**PITAL. (315 Beds.) Obstetrics and Gynæcology HOUSE OFFICERS (2) required. Both posts may be pre-registration. Vacant 30th November and 1st December respectively. The Hospital is recognised for the D.Obst.R.C.O.G.

Applications, with copies of 2 testimonials, to the Secretary.

**WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-**PITAL. (315 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 1st December.

Applications, with copies of 2 testimonials, to the Secretary.

**WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-**PITAL. (315 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area Orthopædic team. Appointment for 6 months in first instance. Vacant immediately.

Applications, with copies of 2 testimonials, to the Secretary.

**WINDSOR. KING EDWARD VII HOSPITAL. Obstetric** AND GYNÆCOLOGICAL HOUSE SURGEON (Male or Female) required for post vacant 1st December. Post recognised for both M.R.C.O.G. and D.Obst.R.C.O.G. Not a pre-registration post. Successful candidate will be resident at the Old Windsor Unit of the Hospital. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, with copies of tecent testimonials or names of 3 referees, to Hospital Secretary by 29th October.

**WOLVERHAMPTON GROUP.**

**The Royal Hospital** (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.

**New Cross Hospital**

HOUSE OFFICER (general surgery), vacant now.

HOUSE OFFICER (general medicine), vacant 25th October. Pre-registration posts.

**Eye Infirmary**

SENIOR HOUSE OFFICER required immediately. 100 Beds and busy Outpatient Department. (Recognised for F.R.C.S. and D.O.M.S. examinations.)

Apply Group Secretary, Royal Hospital, with copies of testimonials.

**WOODFORD GREEN, ESSEX. JUBILEE HOSPITAL.** ANÆSTHETIST required for 2 sessions per week. Salary £175 p.a. for each weekly notional half-day. Candidates should be prepared to undertake a proportion of emergency work. Preference will be given to candidates holding the Diploma of Anæsthetics.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee Forest Group, Langthorne-road, E.11.

**WORCESTER ROYAL INFIRMARY. Applications** invited for the post of HOUSE PHYSICIAN (pre-registration or otherwise).

Applications to the Secretary.

**WORCESTER. RONKSWOOD HOSPITAL. (300 Beds.)** Applications invited for post of HOUSE SURGEON (Senior House Officer) in General Surgery.

Applications, with copies of testimonials, to the Hospital Secretary.

**NORTHERN IRELAND HOSPITALS AUTHORITY.** Applications are invited for 2 whole-time posts as REGISTRAR, 1 in General Medicine at hospitals managed by the Belfast Hospital Management Committee and 1 in Anæsthetics at hospitals managed by the North West Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 1st November, 1955.

**NORTHERN IRELAND HOSPITALS AUTHORITY.** Applications are invited for a whole-time post as REGISTRAR in General Surgery at hospitals managed by the Coleraine and Portrush Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 5th November, 1955.

**WORKSOP. KILTON HOSPITAL. (190 Beds.) Sheffield** REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required. Post vacant 20th November, 1955. Appointment for 1 year in first instance. The Kilton Hospital contains the medical division of the Worksop Group. The successful candidate will be responsible for the supervision of 42 acute medical beds and also of the dermatological and pædiatric beds.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 24th October, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

**B.W.I. UNIVERSITY COLLEGE HOSPITAL OF THE** WEST INDIES. Applications are invited for the post of REGISTRAR in the Division of Medicine at the above-named Teaching Hospital which is in special relationship with the University of London. Higher qualifications desirable but not essential. The successful candidate will be required to be in Jamaica as early as possible after appointment. The appointment will be for 1 year in the first instance, subject to renewal. Salary is payable within the scale £800–£100–£1000/£1100–£100–£1400 p.a., depending on experience and qualifications. Single accommodation and board, or a limited number of unfurnished flats for unmarried or married officers, are provided at a deduction of £125 p.a. or 5 % of salary, respectively. Return first-class passage by sea will be paid for 1 person only.

Further information may be obtained from the Hospital Manager and Secretary, University College Hospital, Mona P.O., Jamaica, B.W.I., to whom applications, stating age, nationality and details of qualifications and experience, together with 3 recent testimonials or the names and addresses of 3 referees, should be sent by 31st October, 1955.

**CANADA. UNIVERSITY HOSPITAL, Saskatoon, Sas-**KATCHEWAN. House Staff appointments. This newly constructed hospital of 523 Beds and 68 bassinets was opened to the public on 26th January, 1955. At present, approximately 400 beds are available and the balance will be opened near the end of this year.

The services cover all departments of medical practice—namely, medicine, surgery, obstetrics, gynæcology, pædiatrics, anæsthesia, bacteriology, diagnostic radiology, neurology, neurosurgery, ophthalmology, orthopædics, otolaryngology, pathology, psychiatry, rehabilitation medicine, therapeutic radiology and urology.

At present, there are 42 in the house staff under a full-time coördinator, the assistant Medical Director. For the coming year approximately 50 will be appointed.

The first year of house staff training is a rotating internship with active responsibilities in patient care. Requirements of the Canadian Medical Association regarding the training for junior internes are carefully observed. Each first-year rotating interne receives 3 months each in medicine and surgery, 2 months each in obstetrics with gynæcology and pædiatrics. The remaining 2 months are available as optional either in the 4 major services or in special fields. For those who wish to pursue a general practice, a 2-year training programme will be provided.

Emolument (not including board allowance) :—

(*a*) Junior interne $75 per month.
(*b*) Senior interne $125 per month.
(*c*) Assistant resident $175–$200 per month.
Scale according to experience.
(*d*) Resident $250–$300 per month.
Scale according to experience.

Inquiries should be addressed to The Assistant Director (Medical), University Hospital, Saskatoon, Saskatchewan, Canada. Interested parties will receive application forms from the University Hospital for this purpose. Applications for internships must be at the Hospital by 15th January, 1956, and for residencies by 1st December, 1955.

## Public Appointments

**BRISTOL. CITY AND COUNTY OF BRISTOL. Depart-**MENT OF PUBLIC HEALTH. Applications are invited from registered medical practitioners for appointment of an ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER (Male). Salary £975–£50(8)–£1375 p.a. Successful applicant required to carry out maternity and child welfare, school health and port work, and such other duties as may be required by Medical Officer of Health, and must devote his whole-time to these duties and not engage in private practice. Appointment superannuable and subject to passing medical examination.

Applications, on forms obtainable from undersigned, to be returned by 22nd October, 1955.

R. H. PARRY, Medical Officer of Health.

Central Health Clinic, G.P.O. Box No. : 201,
Tower Hill, Bristol, 2.

**DUBLIN. LOCAL APPOINTMENTS COMMISSION.** Vacancy for PÆDIATRICIAN (part-time), Galway County Council. Salary : £800 plus use of certain beds. Essential qualifications include : (i) at least 7 years experience, including 4 years experience in pædiatrics, (ii) M.D., M.R.C.P.I. or equivalent qualification, (iii) D.C.H. or equivalent.

Application forms and particulars from the Secretary of the Commission, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 4th November, 1955.

**DURHAM. COUNTY COUNCIL OF DURHAM.** Applications are invited from registered medical practitioners (Men and Women) for appointment as SCHOOL MEDICAL OFFICER. Applicants must be under 55 years of age and have had at least 3 years experience in the practice of their profession. Salary scale £975–£50–£1375 p.a.

Conditions of appointment and forms of application may be obtained from the undersigned, to whom completed application forms must be returned not later than 7th November, 1955.

G. H. METCALFE, Director of Education.

Shire Hall, Durham, 4th October, 1955.

**FACTORY DOCTORS. Factories Acts, 1937 and 1948.** The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

| *District* | *County* | *Latest date for receipt of applications* |
|---|---|---|
| BRACKNELL .. | BERKS .. | 29TH OCTOBER, 1955 |

**GLAMORGAN EDUCATION AUTHORITY. Borough of RHONDDA. COMMITTEE FOR EDUCATION.** Applications are invited from registered medical practitioners for appointment as ASSISTANT MEDICAL OFFICER, under the supervision of the District School Medical Officer at a salary of £975 p.a., rising by annual increments of £50 to £1375 p.a. Preference will be given to candidates holding the D.P.H. or D.C.H. and experience in paediatrics will be an advantage. The appointment is superannuable and the successful candidate will be required to pass an examination as to physical fitness. The successful candidate, if in need of housing accommodation and not already a resident of the Borough of Rhondda, may be offered the tenancy of a Council house.

Forms of application and conditions of appointment may be obtained from the District School Medical Officer, Tydfil House, Pentre, Rhondda, by whom completed applications should be received as soon as possible. D. J. JONES, Town Clerk.

**GOVERNMENT OF BAHRAIN. British Medical Officer (Female).** Government of Bahrain Medical Department invites applications from British Women Doctors for the post of MEDICAL OFFICER to the Women's Hospital for general duties in Hospital, Outpatients and Village Dispensaries. Age 28–40. Minimum salary at age 28, £1539, rising £45 annually. No allowances. Non-contributory gratuity on retirement, or pension scheme. Private practice among Europeans only. No income-tax. Free quarters with hard furniture and car. Agreement for 2 years, renewable, with 5 months home leave on full pay and free air passages.

Applications, with 3 testimonials and photograph, should be sent to the Chief Medical Officer, Bahrain Government Hospital, Bahrain, Persian Gulf.

**GOVERNMENT OF BAHRAIN. British Surgeon (Female).** Government of Bahrain Medical Department invites applications from British Women Doctors, F.R.C.S. or M.R.C.O.G., for the post of SURGEON to the Women's Hospital. Age 28–40. Minimum salary at age 28, £2157, rising £45 annually. No allowances. Non-contributory gratuity on retirement, or pension scheme. Private practice among Europeans only. No income-tax. Free quarters with hard furniture and car. Agreement for 2 years, renewable with 5 months home leave on full pay and free air passages.

Applications, with 3 testimonials and photograph, should be sent to the Chief Medical Officer, Bahrain Government Hospital, Bahrain, Persian Gulf.

**LONDON COUNTY COUNCIL. Applications are invited** from registered medical practitioners for appointment as Whole-time MEDICAL OFFICER in the Public Health Department. Inclusive salary £975 a year, rising by annual increments of £50 to £1375 a year (subject to review). Commencing salary dependent on local government service. No emoluments. Duties are primarily connected with child health. It will be an advantage if the candidate is experienced in maternity and child welfare work, and the school health service and has the Diploma in Public Health.

Application forms from the Medical Officer of Health (PH/DL), The County Hall, Westminster Bridge, S.E.1, returnable by 27th October, 1955 (1627).

**HER MAJESTY'S OVERSEA SERVICE. Sierra Leone.** MEDICAL OFFICERS are urgently required for general duties including hospital and district work in order to maintain existing standards of service to the public and to make possible much needed expansion. The appointments offer scope for the practice of many branches of medicine and surgery and carry a considerable measure of independence and personal responsibility. Arrangements exist for allowing private practice at the discretion of the Director of Medical Services. Candidates must possess medical qualifications registrable in the United Kingdom and have had at least 12 months postgraduate hospital experience.

There is a permanent career for doctors entering the Sierra Leone Service, but short-term contracts are available. Alternative methods of entry are as follows:—

(*a*) on 3 years probation for permanent and pensionable employment with retiring age of between 45 and 55. Pensions (which are non-contributing) are at the rate of 1/600th of the final pensionable emoluments for each completed month of reckonable services.

(*b*) from the National Health Service. Candidates may resign but retain their superannuation rights up to 6 years and receive a gratuity (taxable) of 20% of the aggregate of their salary.

Salaries, including pensionable expatriation pay, for Officers under (*a*) and (*b*) range from £942 to £1850 a year, or

(*c*) on short-term contract (2 tours of 18–24 months duration each) with inclusive salaries from £1068 to £2000 a year. On completion of contract a gratuity (taxable) is paid at the rate of £37 10s. for each completed period of 3 months service (including leave).

Starting salaries are determined according to age, qualifications and experience. Opportunities exist for transfer and promotion to posts elsewhere in Her Majesty's Oversea Service outside Sierra Leone. Quarters are normally available at low rental. Free passages in both directions are provided for officer, wife, and up to 2 children under the age of 10. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour of 18–24 months duration. The short tours of service enable frequent visits to be made to children being educated at home. Many officers have their children with them until they reach school age.

Application forms from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/15/02).

**HER MAJESTY'S OVERSEA CIVIL SERVICE. Western SAMOA.** SURGEON required for major general surgery in Western Samoa. The climate is healthy and living conditions very pleasant.

Appointment can be made as follows :—

(*a*) On a permanent and pensionable basis, in which case the candidate would be appointed to the South Pacific Health Service and, initially, for a period of 3 years, seconded to Western Samoa ; or

(*b*) On contract for 1 tour of 3 years with gratuity (taxable) on satisfactory completion of service.

Salary is at the rate of £NZ2100 a year and pension is earned at the rate of 1/600th of final pensionable emoluments for each completed month of pensionable service. The gratuity in respect of contract employment is payable on completion of the engagement at the rate of £NZ37 10s. for each completed 3 months of satisfactory service. Free quarters are not provided. If Government quarters are available rent is payable at 10% on first £NZ1200 of salary and 3% of salary above that figure. Income-tax at local rates. Free passages provided on appointment for Officer, wife and children up to the cost of 4 adult passages and on leave up to the cost of 3 adult passages. Leave is earned at the rate of 5 days for each completed month of service. Candidates must be F.R.C.S.

Application forms can be obtained from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD. 117/162/05).

**EASTBOURNE. COUNTY BOROUGH OF EASTBOURNE. HEALTH AND WELFARE SERVICES DEPARTMENT.** DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Applications are invited for the above appointment from registered medical practitioners possessing the Diploma in Public Health or similar qualification. Duties are administrative and clinical. Housing accommodation at an appropriate rental suitable to the needs of the applicant may be made available to the successful candidate if required. Salary in accordance with the scale of £1220–£52 10s.–£1430 a year. A car allowance is provided.

Further particulars and form of application, returnable by 29th October, 1955, from K. O. A. VICKERY, Medical Officer of Health.

Avenue House, The Avenue, Eastbourne.

**HERTFORDSHIRE COUNTY COUNCIL. Assistant** COUNTY MEDICAL OFFICER for West Herts and St. Albans Divisions. Diploma in Public Health or Child Health desirable, but not essential. Salary £975–£50–£1375. Car necessary. Travelling and subsistence according to national scale. House available within a few months of appointment.

Application forms and further particulars from County Medical Officer, County Hall, Hertford. Forms to be returned by 29th October.

**WALTHAMSTOW BOROUGH COUNCIL. Essex County COUNCIL.** DEPUTY MEDICAL OFFICER OF HEALTH AND ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH. Applications are invited from duly qualified and experienced medical practitioners possessing the Diploma in Public Health, or similar qualification, for the above-mentioned posts which together constitute 1 whole-time appointment. Preference will be given to applicants approved by the Ministry of Education as Certifying Officers. The officer appointed will be required to devote one-third of whole-time to duties for the Borough Council and two-thirds to duties for the County Council.

Remuneration (in accordance with appropriate Industrial Court Awards) as follows :—

Borough Council : £487 8s. 2d.–£17 3s. 4d. (5)–£573 4s. 10d.
County Council : £731 5s. 0d.–£37 10s. 0d. (8)–£1031 5s. 0d.

The appointment is subject to medical examination, and in the case of the Borough Council appointment, to the consent of the Minister of Health. Whitley Medical Council conditions of service will apply and also the relevant Standing Orders of the 2 employing authorities. The appointments are superannuable.

Application forms are obtainable from, and returnable to, the Medical Officer of Health, Town Hall, Walthamstow, as early as possible. Canvassing directly or indirectly will disqualify.

G. A. BLAKELEY, Town Clerk.

Town Hall, Walthamstow, E.17, 14th October, 1955.

**WEST BROMWICH. COUNTY BOROUGH OF WEST BROMWICH.** Applications are invited from registered medical practitioners for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER at a salary in accordance with the scale £1222 rising by 5 increments of £51 10s. to £1479 10s. The Council have adopted the conditions of service agreed by the Medical Council of the Whitley Councils for the Health Services.

Full particulars and form of application may be obtained from the undersigned. Closing date for applications 22nd October, 1955. J. M. DAY, Town Clerk.

Town Hall, West Bromwich.

**THE MEDICAL SERVICE OF THE ROYAL NAVY**

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited for Short Service Commissions of 4 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, to be medically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

**COMHAIRLE CONNDAE NA MIDHE.** Meath County Council invite applications for the position of Temporary Part-time ANÆSTHETIST. Rate of remuneration as approved by the Department of Health.

Full details and application forms may be had from the Chief Officer, Health Offices, Meath County Council, An Uaimh. Latest date for receipt of completed application forms Friday, 21st October, 1955, at NOON.

**LANCASHIRE COUNTY COUNCIL.** Appointment of ASSISTANT DIVISIONAL MEDICAL OFFICER. Registered medical practitioner required for appointment of Assistant Divisional Medical Officer in Fleetwood. Possession of D.P.H. desirable. Salary £975–£1375 p.a. Travelling and subsistence allowances where applicable.

Application forms and further particulars from County Medical Officer of Health, Serial 348, East Cliff County Offices, Preston.

**LEICESTER. COUNTY OF LEICESTER. Rural District** COUNCILS OF BLABY AND LUTTERWORTH. Applications are invited from registered medical practitioners possessing the Diploma in Public Health or equivalent qualification for the whole-time joint appointment of ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Blaby and Lutterworth Rural District Councils. The present allocation of the duties is on the basis of 13/22 to the County Council and 9/22 to the District Councils. The salary is in accordance with the awards of the Industrial Court for Public Health Medical Officers holding joint appointments. On the present allocation of duties the salary as Assistant County Medical Officer will be £675 17s. 1d. p.a. rising by 8 annual increments to £953 2s. 6d. and as District Medical Officer of Health £726 3s. 0d. p.a. rising by 4 annual increments to £812 11s. 2d. Consideration may be given to previous experience in fixing the commencing salary. There will be a travelling allowance of £200 p.a. which includes subsistence within the County, and the person appointed will be required to provide his own car and hold a current driving licence. Office accommodation and clerical assistance will be provided by arrangement between the Authorities. The appointment is subject to the terms and conditions of the Whitley Councils for the Health Services (Great Britain)—Medical Council Committee "C": post pensionable.

Forms of application and terms of appointment obtainable from County Medical Officer, 17, Friar-lane, Leicester. Applications must be delivered within 3 weeks from appearance of this advertisement.

**NORTHUMBERLAND COUNTY COUNCIL.** Applications are invited from registered medical practitioners for the appointment of ASSISTANT COUNTY MEDICAL OFFICER to undertake duties primarily connected with maternal and child welfare. Salary will be in accordance with the scale of £975, rising by annual increments of £50 to £1375 p.a. Previous experience may be taken into consideration in determining the commencing salary. Travelling and subsistence allowances when applicable will be paid in accordance with the Council's scale. The appointment is subject to superannuation and will be determinable by 3 months notice on either side. The successful candidate will be required to pass a medical examination.

Forms of application and any further particulars required may be obtained from the undersigned and must be returned not later than 5th November, 1955.

JOHN B. TILLEY, County Medical Officer.

County Hall, Newcastle upon Tyne, 1.

## General Practice

*For an Executive Council post (England and Wales) apply on form* E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

**EXECUTIVE COUNCIL FOR THE COUNTY BOROUGH** OF MERTHYR TYDFIL. Applications are invited from medical practitioners wishing to undertake General Medical Services in the Dowlais District of the County Borough of Merthyr Tydfil. The practice vacant is single handed, and at present comprises approximately 2786 patients. Residence and separate surgery accommodation available. Applications on Form E.C.16A (obtainable from the address given below), should be sent to the undersigned and should be received not later than Saturday, 22nd October, 1955.

I. PRITCHARD,
Clerk of the Merthyr Tydfil Executive Council.

"Glasdir," 24, Victoria-street, Merthyr Tydfil.

## Appointments : Too Late for Classification

**EAST END MATERNITY HOSPITAL, 394/398, Commercial-road, London, E.1.** (60 Beds.) Post recognised for M.R.C.O.G. RESIDENT OBSTETRICAL OFFICER (House Officer, third post), required for 6 months. Post vacant 1st November, 1955.

Applications, with copies of testimonials, to the Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

**MANOR HOUSE HOSPITAL, Golders Green, N.W.11** (exempted from National Health Service). Required, RESIDENT SURGICAL OFFICER (Male). Salary £745 p.a., less £130 p.a. for emoluments. 6 months appointment, renewable.

Applications, stating age, nationality, qualifications, and surgical or orthopædic experience, with copies of 3 recent testimonials, to Mr. W. F. PENDRILL, Secretary.

**VENTNOR, I.W. ROYAL NATIONAL HOSPITAL FOR** DISEASES OF THE CHEST. (249 Beds.) Required, JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (resident post). Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

## Miscellaneous

*To non-professional posts the Notification of Vacancies Order* 1952 *applies*

**Medical Officer required by Falkland Islands Dependencies** Survey for tour of 18 or 30 months service in Antarctic bases. To leave U.K. in December, 1955. Salary £625 a year. Free passages, quarters, messing and canteen stores. Liberal leave on full salary. Candidates must possess qualifications registrable in the United Kingdom. Candidates liable for call up under National Service Acts may apply and, if appointed, they will, subject to approval of appropriate authorities, be granted indefinite deferment of call up on completion of their tour of duty.—Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications, and experience, and quote M3A/35315/LD.

**Mayfair Practitioner with extensive private and State** registered practice, requires full-time Assistant, preferably between 27 and 33 years of age. View to eventual partnership.—Address, No. 169, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

**The Society of Medical Officers of Health invite applications** for the post of Medical Secretary (part-time). The salary offered is within the scale £750–£1000.

Applications, endorsed "Medical Secretary" and containing full details of the applicant's professional career, should be forwarded to the Medical Secretary, SOCIETY OF MEDICAL OFFICERS OF HEALTH, Tavistock House South, Tavistock-square, W.C.1, and must be received not later than 15th December.

**Applications are invited from registered medical practitioners** for the post of part-time Medical Officer to the Ilford works of The Plessey Company Limited. The successful candidate will be required to undertake all the duties of an Industrial Medical Officer. Candidates should have a high standard of ability in clinical medicine, combined with interest in, and experience of, preventive and/or industrial medicine. Amount of time to be spent in the works, approximately 10 hours per week, or possibly more by arrangement. Salary commensurate with experience and hours of work.—Applications, with full details of age, qualifications, training and experience, to be made in the first instance to The Personnel Manager, THE PLESSEY COMPANY LIMITED, Ilford, Essex.

**Senior Psychiatrist. Eligible for State License in Maine,** to join staff of Pownal State School, New Gloucester, Maine. Dynamically oriented staff. Departments of Education, Clinical Psychology, Psychiatric Social Work, O. T., full-time Chaplaincy, Pathologist, Dentist, Res. Lab. Salary depending on qualifications. Numerous State benefits.—Apply to Superintendent, Box C, Pownal, Maine, U.S.A.

**Paediatrician, with M.R.C.P. or F.R.C.P., for Southern** Ontario Clinic. Full-time appointment in private practice in a clinic including Physician, 2 Surgeons, and Obstetrician. Population 100,000 within 10-mile radius. Starting salary £2800 yearly.

In reply state training, experience, references, and enclose recent photograph, to: Address, No. 170, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

**Part-time Laboratory Technician also part-time X-ray** Technician wanted.—Please write: Address, No. 168, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

**Experienced St. Thomas's man desires part-time employment** London or Home Counties.—Address, No. 171, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

**"Pregnancy Diagnosis by the Xenopus Method," 24-hour** service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

**Hypnotism. Will all Doctors interested in this subject** for Medical purposes please write to the Secretary, British Society of Medical Hypnotists, 126, Harley Street, W.1.

**Applicants for posts requiring testimonials copied or** duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

**Typewriting and Duplicating. First-class work at moder-**ate prices by experienced medical typists.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM. 5329/0504).

**Microscopes. Highest prices paid for good modern types.** Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

**The New M.G. "A" and Magnette. Limited number of** orders now acceptable from proven essential users for delivery ahead.—Demonstrations, brochures, easy terms, application forms on request from H. A. SAUNDERS LIMITED, 140–144, Golders Green-road, Golders Green, London, N.W.11 (SPEedwell 0011).

**Ford Zodiac, Zephyr and Consul. Limited number of** orders now acceptable from proven essential users for delivery ahead.—Demonstrations, brochures, easy terms, application forms on request from GORDON CARS (LONDON) LIMITED, 1–3, Broadwalk-lane, Golders Green-road, Golders Green, London, N.W.11 (SPEedwell 0014).

**Riley Pathfinder. Limited number of orders now accept-**able from proven essential users for delivery ahead.—Demonstrations, brochures, easy terms, application forms on request from H. A. SAUNDERS LIMITED, 140–144, Golders Green-road, Golders Green, London, N.W.11 (SPEedwell 0011).

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